132
1

SCIENCE ABSTRACTS.

SECTION A.—PHYSICS.

VOL. XVI
1913.

Issued by
THE INSTITUTION OF ELECTRICAL ENGINEERS,
VICTORIA EMBANKMENT, LONDON, W.C.;
Compiled and Edited by the Institution, in association with
THE PHYSICAL SOCIETY OF LONDON;
With the Co-operation of
THE AMERICAN PHYSICAL SOCIETY,
THE AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS, and the
ASSOCIAZIONE ELETTROTECNICA ITALIANA.

EASTMAN KODAK CO.
LIBRARY
KODAK PARK

LONDON:
E. & F. N. SPON, LIMITED, 57, HAYMARKET, S.W.
NEW YORK:
SPON & CHAMBERLAIN, 123, LIBERTY STREET.

V.16
1913

ERRATA.

Section A.—PHYSICS.

Abstract No. 76, line 4 : *for* Hönigschmidt, *read* Hönigschmid.
Abstract No. 78, line 19 : *for* Hönigschmidt, *read* Hönigschmid.
Abstract No. 153, line 7 : *for* Kirkcaldy, *read* Kirkaldy.
Abstract No. 266, line 3 : *for* Lune, *read* Laue.
Abstract No. 338, p. 114, line 4 : *for* Loschmindt, *read* Loschmidt.
Abstract No. 384, line 6 : *for* Lohmann, *read* Lehmann.
Abstract No. 466, line 3 : *for* R. H. Millikan, *read* R. A. Millikan.
Abstract No. 507, last line : *for* 1910, *read* 1911.
Abstract No. 547, line 11 : *for* Sommerfield, *read* Sommerfeld.
Abstract No. 620, line 2 : *for* No. 14, *read* No. 15.
Abstract No. 1051, p. 341, line 12 : *for* Joulian, *read* Joulean.
Abstract No. 1065, line 3 : *for* Beckmann, *read* Beckman.
Abstract No. 1171, line 4 : *for* No. 133*c*, *read* No. 131*c*.
Abstract No. 1212 : *should* read, Abstract No. 1221.
Abstract No. 1293, line 4 : *for* 3×10^{-19}, *read* 3×10^{-9}.
Abstract No. 1483, last line : *for* Grossman, *read* Grossmann.
Abstract No. 1601, line 1 : *for* Limits, *read* Limbs.
Abstract No. 1648, line 2 : *for* Houston, *read* Houstoun.
Abstract No. 1837, line 6 : *for* Darwen, *read* Darwin.
Abstract No. 1880, line 1 : *for* Hopgood, *read* Hopwood.

AUTHORS' CORRIGENDUM.

Abstract No. 1686 : for corrected numbering of plates, *see* Ann. d. Physik, 41. p. 1064.

ACCESSION
No. 2268

V. 16

.16
913

SUBJECT INDEX.

SECTION A.—PHYSICS.

To facilitate reference to any desired subject, the Index is divided into the following sections arranged alphabetically. If any of these are absent this may be taken as an indication that no Abstracts dealing with those particular subjects have been included in this volume.

Where phenomena such as the Hall-effect, Thomson-effect, Zeeman-effect, etc., are mentioned in an Abstract but not in the Title, the reference will be found in the Name Index.

The numbers refer to Abstracts.

In General Physics:—Apparatus and Instruments (physical, excluding electrical, descriptive); Astronomy; Diffusion; Dynamics; Elasticity; Gravity; Measurements and Use of Instruments; Meteorology, &c.; Miscellaneous; Molecular Physics, Matter and Ether; Pressures (high and low); Surface Tension; Terrestrial Physics; Theories; Viscosity.

In Light:—Absorption; Dispersion; Interference; Measurements and Use of Instruments; Miscellaneous; Phosphorescence and Fluorescence; Photography; Photometry; Polarisation; Radio-activity; Rays and Radiation; Reflection of Light; Refraction of Light; Spectra; Vision; Zeeman-Effect and Radiation in a Magnetic Field.

In Heat:—Absorption; Conductivity; Critical Points and Constants; Dilatation; Freezing-, Melting-, and Boiling-Points; Gases and Vapours; Measurements and Use of Instruments; Miscellaneous; Specific Heat and Latent Heat; Temperature; Temperatures (high and low); Thermodynamics; Thermometry, Pyrometry, and Calorimetry; Vapour Pressure.

In Sound:—All Abstracts referring to this subject have been indexed under *Sound*.

In Electricity and Magnetism:—Absorption; Alternate-Current Research; Apparatus and Instruments (descriptive); Capacity (electrostatic); Conductivity and Resistivity; Dielectrics; Discharge in Gases and in Vacuo; Electromagnetic Theory; Inductance (self and mutual); Magnetism; Measurements and Use of Instruments; Electro-Physiology and Radiology; Miscellaneous; Oscillations and Waves; Polarisation (electric waves); Polarisation (electrolytic); Static and Atmospheric Electricity; Terrestrial Magnetism and Electricity; Thermo-Electricity and Thermo-Magnetism.

In Chemical Physics:—Absorption; Alloys; Batteries (primary); Batteries (secondary); Chemical Equilibrium; Dissociation and Ionisation; Electric Furnace Processes; Electrolysis; Electrolytic Analysis; Metallography and Properties of Metals; Miscellaneous; Osmosis; Solution and Solubility.

Abstract Nos.

Absorption (Chemical Physics).
Charcoal, Heated, Adsorption by. K. Arndt and G. Schraube......... 1888
Effects produced by Heating and Cooling Palladium in Hydrogen. J. H. Andrew and A. Holt 1970
Gases, Adsorption of, by Carbon and other Substances. W. Hempel and G. Vater 130
Helium, Absorption of, under Electric Discharge. R. J. Strutt 267
Hydrogen, Active, Adsorption of, by Platinum. A. E. Freeman...... 1889
Absorption (Light and Heat).
Absorption, Dispersion, and Fluorescence of Light. B. Söderborg 1420
Atmosphere, Absorption of Light in. G. Müller 772
Benzene, Absorption of Light in Solutions of. J. de Kowalski and E. Banasinski......... 50
Electric Field, Absorption Coefficient in. H. J. van der Bijl and G. Szivessy 973

Abstract Nos.
Absorption (Light and Heat), *continued*.
Flames, Coloured, Selective Absorption by. R. Ladenburg and F. Reiche 1641
„ , Luminous, Absorption by. R. Ladenburg 974
Gaseous Media, Scattering and Absorption of Light in. L. V. King 1133
Gases, Absorption of, in Infra-red. E[va] v. Bahr 1946
Gold, Solid and Liquid, Emissivity of. C. M. Stubbs and E. B. R. Prideaux 442
Heterogeneous Bodies, Denial of, Kirchhoff's Law for. W. Voigt ... 197
„ Media, Absorption of Light in. P. G. Nutting 1422
Physical Condition, Influence of, on Absorption of Light. G. H. Livens 168
Radiation of Heat and Light, *see* section Rays.
Resonance with Longest Thermal Waves. R. W. Wood 1003
Röntgen Rays, Absorption of, *see* section Rays and Radiation.
Scattering of Light. F. Herxheimer 390
Selective Absorption and Elastic Deformation. P. Selényi 1264
Silver Solutions, Colloidal, Absorption Curves of. R. Gans 791
Space, Absorbing Medium in. E. S. King 940
Spectro-polariscopic Method for Investigating Light-absorption. N. Umow 169
Stratified Bodies, Emission and Absorption of. W. Voigt 403
Ultra-violet Light, Absorption of, by Acetylene. V. Henri and M. Landau 1147
Water, Absorption of Light by, Changed by Hydrated Salts. J. S. Guy, E. J. Shaeffer, and H. C. Jones 1276
Alloys.
Aluminium, Alloying of. C. H. Ivinson. 1529
„ and Tin, Special Bronzes of ; Acicular Constituents. F. Robin 885
„ and Zinc, Alloys of. W. Rosenhain and S. L. Archbutt 276
„ -Copper-Zinc Series, Liquidus curves of. H. C. H. Carpenter and C. A. Edwards 1214
„ -Silver Alloys, Hardness of. G. Le Grix and W. Broniewski 1895
Amalgams, Liquid, Constitution of. J. H. Hildebrand 1554
„ , Volume-changes of. J. Würschmidt 719
Annealing, Influence of, on Structure of Alloys. A. Portevin 1535
Cerium-Aluminium Alloys. R. Vogel 1537
Chemical Method for Study of Alloys. A. Portevin 526
Cobalt, Alloys of, with Chromium, etc. E. Haynes 720
Copper-Tin Alloy : Effect of Casting Temperature. E. Heyn and O. Bauer 1897
„ -Zinc Alloys, Tensile Strength of. J. M. Lohr 884
„ „ „ : Influence of other Metals on β Constituent. H. C. H. Carpenter 1216
„ Zinc-Nickel Alloys. L. Guillet 528
Electrolysis of Alloys, *see* section Electrolysis.
Gold-Silver Alloys. U. Raydt 1534
Iron and Steel, *see also* section Metallography.
Magnetic Properties of Alloys, *see* section Magnetism.
Manganese-Silver Alloys. G. Arrivaut 1536
Metallography, *see* separate section.
Oxygen, Influence of, on Properties of Alloys. E. F. Law 275
Palladium-Antimony Alloys. W. Sander 1533
Plastic Alloys, Deformation of. A. Portevin 882
Platinum-Aluminium Alloys. M. Chouriguine 527
Strengths of Thermally-treated Metals and Alloys. W. Müller 883
Thallium and Tellurium : Metallographic Investigation of System. M. Chikashige 1364
Volatilisation of Certain Binary Alloys in High Vacua. A. J. Berry 1085

For the **Explanation** of this Index see p. 697.

V.16
1913

Abstract Nos.

Alternate-Current Research.
Arc, Electric, *see also* section Discharge.
Arc, Singing, Oscillographic Study of. J. E. Hoyt 494
Current Induction in Vibrating Cylinders. J. Kern 2004
„ -potential Curves of Oscillating Spark. S. R. Milner 492
Intermittent Contact, Action of, in A.C. Circuit containing Capacity. A. Lampa 124
Measurements, *see* separate section.
Rectification of Photoelectric Cell. S. H. Anderson 1050
Rectifier, Mercury Arc, under Alternating Current of High Frequency. H. Busch 1869
Resistance Boxes, Phase Factor of Coils in. W. Hüter 866
Resistance of Flat Spirals and Short Coils for H.F. Oscillations. R. Lindemann and W. Hüter 1195
Skin Effect in Alternating-current Conductors. R. Swyngedauw ...1239B
Stroboscopic Effects obtained with Incandescent Filaments as Illuminant. C. F. Lorenz 670
Valves, Aluminium, at High Frequencies. J. Zenneck 1721
„ , Electric, Alternate-current Circuits with. N. Papalexi 688

Apparatus and Instruments (Electrical, Descriptive).
α- and β-Rays, Method of Counting. H. Geiger 1873
Ampere, International, Determination of, in Absolute Measure. E. B. Rosa, N. E. Dorsey, and J. M. Miller 499
Braun-tube Photographs, Instantaneous. J. Zenneck 1189
Conductivity of Electrolytes, Apparatus for Measuring. E. W. Washburn and J. E. Bell 1070
Converter, Electric. W. I. Book 1878
Declinometer, Compass, New Type of. R. L. Faris 251
Detector, Incandescent Filament Wireless, New Type of. Q. Majorana 452B
„ , Wireless, Bunsen Flame as. G. Leithäuser 230
Electro-dynamometer, Tubular, for Heavy Currents. P. G. Agnew 1502
Electrometer, Idiostatic. V. Crémieu 1057
„ , New Absolute. A. Guillet and M. Aubert 250
„ , New Type of. B. Szilard 1058
„ , Self-recording. J. Patterson 1729
„ , Sensitive. C. Mülly 1201
„ , String, Recent Improvements in. C. W. Lutz 123
„ , Vibration: Application to Alternating-current Measurement. H. Greinacher 1346
Electroscope, Torsion, in Radio-activity Measurements. M. La Rosa 1059
Furnace, Electrical Goniometer, for Measurement of Crystal Angles. F. E. Wright 1739
„ , Electric, for Experiments in Vacuo up to 1500° C. R. E. Slade 687
Galvanometer, Damped Moving-magnet. C. Féry 685
„ , Magnetic Shunt Vibration. H. Tinsley 247
„ , Rectangular, Construction of. A. Ferguson 512
„ , Sensitive, Moving-coil. H. Rohmann 1055
Galvanometers. F. Paschen 1726
Generator of Short Electric Waves. F. F. Martens and I. Ganswindt 1870
Influence Electrical Machine, Improved. H. Wommelsdorf 686
Interrupter, New Current, for Spark Inductors 1885
Interrupters, Spark-coil, New Scheme of Connections for. W. Burstyn 681
Magnet, Alternating-current. E. Wilson 748B
Magnetic Potential, Apparatus for Measuring. W. Rogowski 1063B
Mercury Lamps, Quartz, New Construction for. A. Tian 1053
Micrometer, Electric. B. Thieme 2
Model, Kinematic, for representing Current and E.M.F. in Three-phase System. S. Marcucci 1054

For the **Explanation** of this **Index** see p. 697.

.16
913

Abstract Nos.

Apparatus and Instruments (Electrical, Descriptive), *continued.*
  Motor, Electrostatic. E. Bloch 1504
  Optophone. E. E. Fournier d'Albe 964
  Oscillograph Interference. A. Guyau 1056
  Pendulum, Electric. M. Schanzer 1757
  Pyrometers, *see* section Thermometry.
  Radiometer, Improved Joule, and its Applications. F. W. Jordan ... 622
  Range of α-Particles, Demonstration of. K. Przibram 80
  Relay, New Sensitive. H. Rohmann 1347
  Resistances, Precision, for High-frequency Currents. K. W. Wagner and A. Wertheimer 1345
  Resonance Curves, Demonstration of. F. Kock 864
  Thermometers, *see also* section Thermometry.
  Thermostat, Automatic, Electric Heater with. A. L. Clark 620
  Voltage Divider for High-voltage Measurements. E. Orlich and H. Schultze 408
  Voltmeter, Compressed-air High-pressure. C. E. Guye and A. Tscherniavsky 1503

Apparatus and Instruments (Physical, excluding Electrical, Descriptive).
  Apophorometer. J. Joly 1068
  Boyle's Law, Apparatus for. P. Gehne 192
  Calorimeter, Anethol. U. Grassi 1444
  „ , New Precision. P. G. Nutting 1411
  Camera, Kinematograph, New Type of. K. Prosynski 1640
  „ , Spectroscopic, for Projection. A. J. Bull 1409
  Capillary Waves, Apparatus for Measurement of. L. Grunmach ... 918
  Chromoscope. L. Arons 166
  Chronograph, Printing, New Form of. W. Gaertner 1567
  Clouds, Observation of Motion of, with Perspective Nephoscope. A. Lo Surdo 570
  Collimator, Spectrograph, New Form of. P. Fox 962
  Colour-filters, Gelatine, for Mercury Lamps. H. Schultz 1263
  Comparator for Base Unit at Potsdam. F. Kühnen 741
  „ , Large, of German Standards Commission. W. Kösters 143, 1764
  „ , Simple, for Testing of End-gauges. W. Breithaupt 1765
  Compass, Anschütz Gyroscopic, Theory of. O. Martienssen 22
  Compensator, Soleil-Babinet, with Half-shadow Arrangement. G. Szivessy 1124
  Computer, Exponential. L. Ross 537
  Condenser, Bispherical Reflecting, for Ultramicroscopy. H. Siedentopf 579
  Co-ordinates, Rectangular, Instrument for Registering 21
  Deformation and Stresses of Materials, Registration of Relation between. A. Gagarine 761
  Densities, Gas, at High Pressures. A. Occhialini 539
  Distance, Apparatus for Measurement of. E. Hammer 901
  Evaporation on the Nile near Khartum. R. Türstig 567
  Eyepieces, New Microscope. Metz 1125
  Flight, Measuring, of Flying Machines. L. Ambronn 1107
  Focometer, Abbe. H. Fassbender 1808
  Grating, Concave, Autocollimating Mounting for. H. C. Richards 960
  Gyroscope Mechanism. J. W. Gordon 1766
  Gyrostatic Action, Novel Illustrations of. J. G. Gray 158
  Integraph for Equation of Motion of Projectile. E. Pascal 1374
  Manometer, Quartz, New Form of. G. E. Gibson 1069
  „ , Sensitive. A. Piccard 1
  „ , Spurge's 1235
  Manoscope, Sensitive Thermoelectric. Guéritot 1389
  Measuring Machine, Reinecker. A. Leman 742
  Micromanometer. A. Henry 538

For the **Explanation** of this Index see p. 697.

V.16
1913

Abstract Nos.

Apparatus and Instruments (Physical, excluding Electrical, Descriptive), *continued.*
Micromanometer, New. J. D. Fry 1236
Micrometer, Electric. B. Thieme 2
Micro-photometer for Photographic Density. H. Buisson and C. Fabry 1410
„ -photometer, Registering. P. P. Koch 400
„ -radiography: New Application of Röntgen Rays. P. Goby... 787
Microscope Preparations, New Mounting for. C. Cépède 1126
„ Slide, Electrically-heated. F. G. Cottrell 578
„ , Long-focus. F. Robin 48
„ , Thermal, for Minerals at High Temperatures. F. E. Wright 1261
Mirrors, Formation of, by Scattering. G. Rümelin 790
Objective, 24-inch, of Sproul Telescope. J. A. Miller and R. W. Mariott 963
Ocular, New Reflection. P. G. Nutting 167
Orthophotography. J. M. Lahy 1237
Pendulum, Electric. M. Schanzer 1757
„ , Quartz. M. Schanzer 1922
Photometer, New Acuteness-of-Vision. R. Pauli 49
„ „ Bar. W. B. Ferguson 382
Pyrometers, Optical, *see also* section Thermometry.
Radiometer Attachment for Monochromatic Illuminator. W. W. Coblentz 788
Reflector, Cassegrain, with Corrected Field. R. A. Sampson 1639
Refraction, Double, of Optical Glass. H. Schulz 1807
Resilience 905
Ruler for Drawing Curves. Berkeley 145
Seismograph, Bifilar Conical Pendulum. C. Mainka 347
„ , Direct-reading. V. Crémieu 1568
Seismographic Apparatus. B. Galitzin 1760
Seismographs, Controlling the Period in. F. A. Perret 1761
Spectrograph, Grating. L. Geiger 383
„ , Plane Grating, for Stellar Work. J. S. Plaskett 961
„ , Prism. P. Weiss and R. Fortrat 786
Spectrophotometer for Ultra-violet. F. P. Defregger 1805
„ , New Types of. J. R. Milne 1938
„ , „ , with Savart's Polariscope. M. Wagner ... 1142
Stereoscope, New Mirror. C. Pulfrich 1141
Stress Distribution, Determination Optically of. E. G. Coker 320
Strioscope and Interferential Striograph. G. Sagnac 1262
„ , Interferential. G. Sagnac 1412
Sublimates, Method of obtaining. A. L. Fletcher 828
Surveying, Stereophotographic. O. Lemberger 744
Telethermograph, Mechanical Differential. L. J. Briggs 824
Testing Machine, 1000-ton, at Bureau of Standards. M. Kurrein ... 1375
„ „ , Small Hydraulic. Genès 1758
„ „ , Universal. M. Kurrein 155
Thermostat for Low Temperatures. F. Henning 826
„ with Air-heating. F. Göpel 190
Viscosimeter, Precision. E. W. Washburn and G. Y. Williams 1576
Wave Model. H. Barkhausen 1703
X-ray Fluorescence. W. Kaufmann 1442

Astronomy.
Absorbing Medium in Space. E. S. King 940
Actinometry, "Yerkes," Scale of. J. A. Parkhurst 376, 1616
Algol, Spectrographic Observations of. A. Bélopolsky 46
„ , „ „ „ . F. Schlesinger 952
ι Aurigæ. Eclipsing Binary. H. Shapley 1620
Aurora Borealis, Expedition for Observation of. C. Störmer 1259
„ Spectrum, Photographs of. L. Vegard 1936

Abstract Nos.

Astronomy, *continued.*
Binaries, Eclipsing, Orbits of 44. H. Shapley 947
Binary, Spectroscopic. BD—1°943. Z. Daniel 1623
Bode's Law, Substitute for. [Miss] M. A. Blagg..... 1603
9 Camelopardalis, Spectroscopic, Binary. O. J. Lee 949
α Canum Venaticorum, Periodic Spectrum of. A. Bélopolsky..... 1638
Chromosphere and Radium. S. A. Mitchell, J. Evershed, F. W. Dyson 40
„ , Radium in. S. A. Mitchell 1794
Coma Berenices, Magnitudes of Stars in. Hnatek 956
Comet Gale (1912*a*), Spectrum of 44
„ „ „ „ . P. Idrac..... 371
„ 1912 (*b*), Identity of, with Tuttle's Comet. G. Fayet 43
„ Quénisset (1911*f*), Spectrum of. G. Zappa 1406
„ Schaumasse (1913*a*), Spectrum of, J. Bosler 1802
Corona Spectrum, Physical Interpretation of. J. W. Nicholson..... 1595
α Coronæ Borealis, Radial Velocity of. K. Schwarzschild..... 1625
Coronium and Helium. A. A. Buss 39
Cosmical Physics, Important Problems in. C. Störmer.....779, 780
R Cygni, Observations of, near Minimum. T. E. Espin 784
Double Stars, Spectroscopic, Distribution of. P. Stroobant..... 1407
RR Draconis, Algol-variable. F. H. Seares 576, 1619
Durchmusterung, Northern. E. C. Pickering 1612
„ , Scale of. E. C. Pickering..... 942
Eclipse Measurements, Photoelectric. J. Elster and H. Geitel 571
Fireballs and Shooting Stars. W. F. Denning..... 1631
ε Hydræ A.B., Binary System, Orbit of. R. G. Aitkin 950
Jupiter, Curious Aspect of Third Satellite of. J. Guillaume 1260
Light-changes, Rate of, in Celestial Objects. S. I. Bailey..... 1621
Luminosity of Black Bodies at High Temperatures. C. Nordmann 1697
Lunar Atmosphere, Evidence for. M. E. J. Gheury 1799
„ Changes, Possible. P. Stoïan 941
R Lyræ, Spectrum of. S. Albrecht..... 1622
Mercury, Transit of, November 14, 1907. N. Donitch 369
Meteor, Detonating, of September 23, 1913, Path of. G. v. Niessel... 1630
Milky Way, Integrated Spectrum of. E. A. Fath 782
„ „ , Photographic Chart of. C. Easton 1617
Moon, Temperature of. F. W. Very 1798
Nebula, Pleiades, Spectrum of. Slipher 955
Nebulæ and Star Clusters, Photographs of. H. D. Curtis..... 372
„ , Gaseous, Spectra of. A. J. Cannon..... 1629
„ , Spectra of. J. Meunier 1408
Neptune's Faint Equatorial Belts. T. J. J. See..... 1800
Nova Geminorum (1912), Enhanced Lines in. H. F. Newall and F. J. M. Stratton 1607
„ Geminorum (1912), Parallax of. F. Slocum 1609
„ „ „ , Spectra of. S. B. Barrett 957
„ „ „ , Spectrum of. W. S. Adams and A. Kohlschutter 378
„ Geminorum (1912), Spectrum of. F. J. M. Stratton..... 574
„ „ „ , „ . F. C. Jordan 1608
„ „ „ , „ . F. Küstner 1610
„ Lacertæ, Proper Motion of. Balanowsky 45
Novæ, Recent Observations of. E. E. Barnard 1634
Parallax of Weisse, 592. E. Kinberg 577
α Persei, Radial Velocity of. J. H. Pitman 1627
ϕ Persei, Chromospheric Lines in Spectrum of. P. W. Merril 953
„ , Spectrographic Observations of. F. C. Jordan 954
Y Piscium and RR Draconis, Provisional Orbits of. H. Shapley ... 1614
Planets and Satellites, Origin of. K. Birkeland, C. Störmer 368
„ „ „ , „ . K. Birkeland 1801
„ , Minor, Visual Search for. J. Lagrula..... 1604

V.16
1913

Abstract Nos.

Astronomy, *continued.*

Planets, Satellite Systems of. E. Belot 370
„ , Small, Identification of. L. Fabry 381
Polar Sequence, Magnitude Scale of. F. H. Seares 945
Pole Star, Variability of. A. Pannekoek 1405
Prominences, Frequency of, on East and West Limbs. J. Evershed 1601
„ , Types of, associated with Sun-spots. [Mrs.] M. A. Evershed 1600
Radial Velocity Determinations with Objective Prism. F. Schlesinger 1632
Refraction, Atmospheric, Irregularities in. F. Schlesinger 939
Saturn's Satellite, Titan, Mass of. H. Samter 34
Scintillation, Study of. C. Gallissot 374
β Scorpionis, Spectrum of. J. C. Duncan 377
Solar Activity, Relations between Different Phenomena of. A. Riccò 1402
„ Atmosphere, Circulation in. F. Slocum 1599
„ „ , Conditions of Equilibrium of. G. Gouy 1593
„ „ , Magnetic Field in. H. Deslandres 367
„ „ , Pressure in. C. E. St. John 937
„ „ , Refraction by. R. S. Capon 1597
„ „ , Upper, Structure of. H. Deslandres 36
„ Corona, Constitution of. J. W. Nicholson 365
„ Eclipse Expedition to Vavau, April 29, 1911. W. J. S. Lockyer 1804
„ „ , Partial, at Greenwich, April 17, 1912. Photographs of 573
„ „ , Total, at Vavau, April 28, 1911. A. L. Cortie 38
„ Magnetism. K. Birkeland 1935
„ Mass, Diminution of, by Radiation. J. Bosler 1795
„ Motion, Determination of. W. Dziewulski 42
„ Photosphere, Gaseous, Theory of. Gouy 1797
„ Radiation, Atmospheric Transmission of. F. W. Very 938
„ „ , during Eclipse, April 17, 1912. W. Gorcynski 935
„ „ , Effect of Atmospheric Turbidity of 1912 on. H. H. Kimball 1256
„ Radiation, Measurements of, C. G. Abbot 1598
„ „ , Total, during Annular Eclipse. W. H. Julius 1605
„ „ , Variation of. C. G. Abbot, F. E. Fowle, and L. B. Aldrich 1606
„ Rotation in 1911. J. S. Plaskett and R. E. De Lury 1596
„ Spectrum Wave-lengths, Variations of. A. Perot 366
„ „ , Limit of. C. Fabry and H. Buisson 980
„ Surface, Magnetic Fields at. Gouy 1404
„ System, Motion of. W. H. Pickering 364
Star-Streams, Two, Constants for. J. C. Kapteyn and H. A. Weersma 379
Stars with Peculiar Spectra. [Miss] A. Cannon 1637
„ , Bright, Distribution of, in Space. A. S. Eddington 1611
„ , „ , Galactic Motions of. H. C. Plummer 1615
„ , „ , Motions and Distances of. H. C. Plummer 785
„ , Carrington's Circumpolar, Distribution of. F. W. Dyson 1613
„ , Determining Angular Diameters of, by Polarised Light. S. Pokrowsky 47
„ , Faint, Proper Motions of. G. C. Comstock 958
„ , Hottest. A. Pannekoek 1635
„ , New Eclipsing Variable. J. Stebbins 948
„ , Real Temperatures of. C. Nordmann 1633
„ , Relation between Spectra and other Characteristics of. H. N. Russell 783
„ , Relation between Spectrum and Colour Index of. J. A. Parkhurst 946
„ , Systematic Motions of. B. Boss 944
„ , Variable, Elements of Eclipsing. H. N. Russell 35
„ , „ , Real Brightness of. H. N. Russell 1618
Stellar Magnitudes and Radial Velocities. G. Jäger 959

For the **Explanation** of this Index see p. 697.

7.16
.913

Abstract Nos.

Astronomy, *continued.*
Stellar Photometry, Influence of Colour and Magnitude in. C. Gallissot 375
„ Radial Velocities. W. S. Adams 1624
„ Spectra with Objective Prism. E. C. Pickering 943
„ „ , Intensity Distribution of Lines in. K. F. Bottlinger 1636
„ „ , Reversals of Calcium Lines in. G. Eberhard and K. Schwarzschild 1628
Sun, Detection of General Magnetic Field of. G. E. Hale 781
„ , General Magnetic Field of. W. Chrétien 1403
Sun's Polar and Equatorial Diameters. R. P. S. Chevalier 1602
Sun-spot Numbers, Relative, Harmonic Analysis of. H. Kimura ... 1796
„ -spots and Terrestrial Magnetic Phenomena. A. L. Cortie...877, 1734
„ „ , Attraction of, for Prominences. F. Slocum 363
„ „ , Radial Motion in. C. E. St. John 936
„ „ , „ Velocities of Vapours in. C. St. John 1937
„ „ , Similarity of Variations of S Persei and of. H. H. Turner 575
„ „ , Systematic Motions of. Hirayama 37
Sun's Rotation, Spectographic Observations of. J. B. Hubrecht...... 572
λ Tauri, Orbit of. F. Schlesinger 951
63 Tauri, Radial Velocity of. K. Schwarzschild 1626
Variables, Eclipsing, Darkening at Limb in. H. N. Russell and H. Shapley 373
„ , Eclipsing, W Delphini, S. Cancri, SW Cygni, and U Cephei, Elements of. H. Shapley 380
Zodiacal Light, Photometric Observations of. Fessenkoff 1803

Batteries, Primary.
Combustion Galvanic Cells. E. Baur and H. Ehrenberg 296
Concentration Cell, Silver Nitrate—Acetone. A. Roshdestwensky and W. C. McC. Lewis 297
Contact Difference of Potential. A. Anderson and H. N. Morrison 106
„ Potential Difference, Air-liquid. G. W. Moffitt 2013
„ „ Phenomena, Charged Surface Layers in. A. N. Shaw 1104
Cu/CuSO$_4$ Electrode: Influence of Addition of Free Sulphuric Acid D. Reichinstein and A. Zieren 2015
Electro-osmotic P.D.'s caused by Movement of Solid Particles in Liquids. J. Stock........ 1225
Galvanic Cells of Water-insoluble Organic Liquids and Aqueous Solutions. R. Beutner 1224
Hydrogen Electrode in Dry and Moist Alcoholic Hydrogen Chloride. R. T. Hardman and A. Lapworth 894
Lead Sulphide Electrode and Passivity of Lead. P. P. Lebedew ... 300
Liquid Contact, Potential due to, Elimination of. A. C. Cumming... 314
„ „ , Potential due to. A. C. Cumming and E. Gilchrist 1910
Lithium Electrode, Potential of. G. N. Lewis and F. G. Keyes...... 1562
Polarisation, *see also* section Polarisation (Electrolytic).
Standard Cells. L. W. Öholm 1342
Tantalum, Potential of. G. v. Hevesy and R. E. Slade 295
Volta-effect. F. Sanford 510
„ . H. Conrad 1728
„ , Critique and Study on Nature of. A. E. Hennings ... 1725

Batteries, Secondary.
Accumulators, Industrial Electrical, *see* section B.
Alkaline Accumulators. E. Friedrich........ 1563
Edison Storage Battery, Tests of. C. W. Bennett and H. N. Gilbert 909B

Capacity (Electrostatic).
Coils, Capacity of. W. Rietz 1495
Coils, Determination of Capacity of. W. Hüter 678
Conjugate Functions, Determination of Electrostatic Capacities by. J. W. Woodrow........ 470
Electrometer, Effective Capacity of, when used as Quantometer. R. Beattie 680

For the **Explanation** of this Index see p. 697.

V.1
191

.16
913

Abstract Nos.

Capacity (Electrostatic), *continued.*
  Measurements, *see* separate section.
  Spheres, Two, Problems relating to. G. B. Jeffery, A. Russell......... 469
Chemical Equilibrium, *see also* section Thermodynamics.
  Equilibria between Metals, *see* sections Alloys and Metallography.
  Ionisation, *see* section Dissociation.
  Sulphur Modifications, Relation between. H. L. de Leeuw............ 273
  „ , Selenium, and Phosphorus Dissociation Isotherms of. G. Preuner and I. Brockmöller 1908
Conductivity (Electric) **and Resistivity.**
  Artificial Metallic Conductors. K. Baedeker 674
  Clay, Felspar, and Quartz, Polarisation E.M.F. of Mixture of. A. A. Somerville 118
  Conductance, Electrical, of Non-aqueous Solutions. L. I. Shaw...... 1102
  „ , „ , of Solutions in Methylamine and Ethylamine. F. F. Fitzgerald 288
  „ , Equivalent, at Infinite Dilution, Calculation of. S. J. Bates 1558
  Conduction, Metallic, Electron Theory of. O. W. Richardson......... 1061
  „ , Surface, of Electricity. J. Stock 498
  Conductivity and Fluidity of Strong Solutions. W. S. Tucker......... 1089
  „ of Atmosphere, *see also* section Static Electricity.
  „ of Electrolytes in Aqueous Solutions at 35°, 50°, and 65°. S. F. Howard and H. C. Jones 289
  „ of Salt Vapours. G. C. Schmidt 1712
  „ of Salts, as conditioned by Temperature. E. J. Shaeffer and H. C. Jones............ 1221
  „ of Solids. E. Weintraub 1060
  „ , Electric, and Light Emission. J. Koenigsberger...... 2002
  „ , „ , of Alloys: Influence of Pressure. B. Beckman 237
  „ , Electric, of Bismuth-Thallium Alloys. A. E. Whitford 115
  „ , Electric, of Certain Crystals. W. C. Röntgen and A. Joffé 1492
  „ , Electric, of Concentrated Salt Solutions. A. Sachanov 2011
  „ , „ , of Diamond. H. v. Wartenberg 496
  „ , „ , of Glass and Rock Crystal. R. Ambronn... 1043
  „ , „ , of Pure Ether. J. Carvallo 1490
  „ , „ , of Thin Films of Dielectric. E. Branly...... 497
  „ , Electrical, of Sulphur. M. Pigulewsky 2003
  „ , „ , of Tellurium. Mlle. P. Collet 1196
  „ , Equivalent, and Ionisation of Nitrates. P. C. Rây and N. Dhar 738
  „ -water, Preparation of. R. Bourdillon 1559
  Electron Atmospheres of Metals, Preliminary Note on. R. W. Wood 865
  Ionisation, *see* sections Dissociation and Ionisation, and Discharge, Electric.
  Measurements, *see* separate section.
  Resistance between Metal and Crystal at Surfaces of Separation. F. Streintz 119
  „ of Carbon Contacts, Study of. A. L. Clark 1049
  „ of Graphite, Effect of Transverse Magnetisation on. D. E. Roberts 117
  „ of Heated Graphite and Carbon. E. F. Northrup 1338
  „ of Metallo-Crystalline Junctions. A. Wesely 673
  „ of Metals, Electrical: Influence of Temperature and Pressure. E. Grüneisen 1047
  „ of Powdered Conductors. A. A. Somerville............ 235
  „ of Pyrites Crystal at Low Temperatures. B. Beckman ... 1493
  „ of Solid and of Liquid Mercury. A. Baltruszajtis 671
  „ , Effect of Magnetic Fields on. C. W. Heaps 1044

For the **Explanation** of this Index see p. 697.

V.16
1913

Abstract Nos.

Conductivity (Electric) **and Resistivity,** *continued.*

Resistance, Electric, of Mixtures of Copper and Mercury. A. P. Schleicher 236
„ , Electric, of Soap Films. A. Hagenbach 1340
„ , Electrical, Change in, due to Pressure. H. K. Onnes and B. Beckman 1339
„ , Electrical, of Metals, Effect of Vibration on. H. L. Brakel 234
„ , „ , of Oxides: Variation with Temperature. A. A. Somerville 116
Resistivity of Metals. E. F. Northrup and V. A. Suydam 1046
Selenium, Action of. A. Pochettino 233
„ , Effect of Abrasion on Conductivity of. F. C. Brown 232
„ , Variation of Resistance of, due to X- and Radium-rays. H. Guilleminot 1197

Conductivity (Thermal).

Air, Thermal Conductivity of, at Low Pressures. A. Trowbridge ... 1839
Crystals, Thermal Conductivity of. N. Botez and H. Hertenstein ... 1300
Insulation, Heat, Experiments on. F. A. J. Fitzgerald 1168
Measurements, *see* separate section.
Metals, Thermal Conductivity of. S. Pagliani 440
Pipe through which Gas flows, Conduction of Heat along. W. F. G. Swann 825
Steady State, Attainment of, when Heat diffuses along Moving Cylinder. [Miss] A. Somers 623

Critical Points and Constants.

Critical Coefficient and Molecular Weight of Substances at Critical Point. A. Boutaric 737
Iron, Displacement of Critical Points of, by Addition of Silicon. G. Charpy and A. Cornu 1898
Measurements, *see* separate section.
Minimum Critical Temperature, Condition for Existence of. J. D. van der Waals 310
Optical Properties of Substances at Critical Point. C. Smith 173
p-T-*v*-surface, Thomson-van der Waals, Realisation of. J. Meyer ... 91
Sulphur, Selenium, and Tellurium, Studies on. E. Beckmann 1892

Dielectrics, *see also* section Capacity.

Air, Dielectric Constant of, at High Pressures. A. Occhialini and E. Bodareu 1048, 1496
Behaviour of Dielectrics after Electrical Excitation. E. Schreiber... 1497
Changes in Dielectric Constant by Strain. E. P. Adams and C. W. Heaps 211
Gutta-percha, Properties of, in Alternating-current Fields. G. L. Addenbrooke 365B
Hysteresis, Dielectric. W. M. Thornton 122
Imperfect Dielectrics. K. W. Wagner 655
Ionised Dielectrics, New Experiments on. A. Zaroubine 241
Kinetics of Dielectrics: Melting-point, Pyro- and Piezo-electricity. E. Schrödinger 1457
Liquid Dielectrics, Existence of Electric Dipoles in. S. Ratnowsky 1874
„ „ , Ionisation of, by Radium Emanation. G. Jaffé... 1710
„ „ , Ionised, Behaviour of, During Passage of Electric Currents. H. J. van der Bijl 108
„ Dielectrics, Slow Ions in. H. J. van der Bijl 1223
„ Insulators, Dielectric Properties of, at High Voltages. L. Pungs 592B
Measurements, *see* separate section.
Residual Charge of Leyden Jar. G. Brentano 107
„ Charges, Theory and Measurement of. A. Anderson and T. Keane 240
Salts, Dissolved, Dielectric Constants of. P. Walden 731
Solid Bodies, Three-plate Condenser and Dielectric Constants of. E. Grüneisen and E. Giebe 509
Thin Films of Dielectric, Electric Conductivity of. E. Branly 497

7.16
.913

Abstract Nos.

Diffusion.
Dissolved Substances, Diffusion of, New Method for determining. L. W. Öholm ... 1097
Electrolyte, Diffusion of, in Gelatine. L. W. Öholm ... 1098
Fractionation by Diffusion: Application to Colloidal Solutions. Part I. S. Dabrowski ... 292
Gases, Coefficient of Diffusion for. J. P. Kuenen ... 1248
Silver, Diffusion of, into Glass. G. Schulze ... 1099
Solids, Diffusion in. C. H. Desch ... 24
Viscosity of Solvent, Dependence of Diffusion on. L. W. Öholm ... 1100

Dilatation.
Copper, Thermal Expansion of, Length Standard and. G. F. K. Langbein ... 146
Dilatometer, Abbe-Fizeau, Measurements of Expansion with. W. Bein ... 88
Liquids, Adiabatic Expansion in. L. Gay ... 1167
„ , Thermal Expansions of, between Boiling-point and Critical Point. J. Meyer ... 1840
Marble, Thermal Expansion of. H. Nisi ... 1689
Solids, Dilatation of. W. Block ... 193
Water, Expansion of, below 0° C. J. F. Mohler ... 439

Discharge in Gases and in Vacuo (Electric), including Discharge of Condensers; *see also* section Rays.
Absorption of Gas in Vacuum Tubes. S. E. Hill ... 486
Absorption, Gas, *see also* section Absorption.
Afterglow, Observations of. B. Thieme ... 1992
Air Films, Electric Currents through. A. Anderson ... 1990
Anode-fall, Influence of Space Charge on. R. Reiger ... 1475
„ Phenomena in Vacuum Discharges. W. G. Cady ... 1191
„ Rays, Formation of, and Anomalous Anode-falls. O. Reichenheim ... 1989
Arc, Singing, Oscillographic Study of. J. E. Hoyt ... 494
Arcs, Metallic, Deposit upon Poles of. W. G. Duffield ... 1996
Atoms, Multiply-charged. J. J. Thomson ... 206
Brush Discharge, Electric, in Water and Salt Solutions. H. Smith ... 1331
„ „ in Chlorine, and Velocity of Ions, Connection between. K. Przibram ... 1477
Canal Rays and Electronic Affinity. J. Franck ... 1714
„ „ , Generation of Light by. L. Vegard ... 1183
„ „ , Hydrogen, Reflection of. E. Wagner ... 1474
„ „ , Influence of Nature of Gas on Disintegration by. V. Kohlschütter ... 223
„ Rays, Nitrogen and Oxygen, Generation of Light by. L. Vegard ... 1473
„ Rays, Primary Velocity of. K. Glimme and J. Koenigsberger 1184
„ „ , Scattering of. J. Stark and H. Kirschbaum ... 1472
„ „ , Secondary. H. Baerwald ... 1470
„ „ „ Rays Liberated by. H. Baerwald ... 220
„ „ , Transmission of, through Thin Partitions. A. N. Goldsmith ... 1715
Carriers of Negative Thermionic Current in Vacuum. G. Owen and R. Halsall ... 1481
Cell, Elster and Geitel Potassium-Hydride. E. Marx and K. Lichtenecker ... 1326
Cells of Alkali Metals, Spontaneous E.M.F. in. J. W. Woodrow ... 111
Characteristic Curves for Gases at Low Pressures. R. F. Earhart ... 853
Conductivity in Cylindrical Fields at Atmospheric Pressure. V. Schaffers ... 1716
Conductivity of Rarefied Gas affected by Magnetic Fields. H. Stassano ... 660
Crookes Dark Space, Influence of Kathode on Length of. F. W. Aston ... 487

Abstract Nos.

Discharge in Gases and in Vacuo (Electric), including Discharge of Condensers, *continued*.

Current Distribution at Kathode of Discharge Tubes. A. Wehnelt... 857
„ -potential Curves of Oscillating Spark. S. R. Milner 492
Cylinders, Concentric, Discharge between, in Gases at Low Pressures F. W. Aston 228
De La Rive's Tube, Electric Discharge in. D. N. Mallick 224
Dendritic Structures, Studies of: Application to Metallography. R. Arpi 754
Dielectric Cohesion. E. Bouty........ 664, 856
Disintegration of Metals. Condensation Nuclei from Hot Wires. J. H. T. Roberts 858
Disruptive Discharge due to Two Striated Positive Columns. A. Wehnelt 1035
Duddell Currents, *see* sections Alternate-Current Research and Oscillations.
Electrons Liberated by Photoelectric Action, Velocity of. K. T. Compton 1465
„ , Emission of, from Tungsten at High Temperatures. O. W. Richardson 1467
„ , Motion of, in Gases. J. S. Townsend and H. T. Tizard... 1462
„ , Slow, and Gas Molecules, Collisions of. J. Franck and G. Hertz 1853
Emission of Charges in Vacuo. E. Henriot 225
Energy absorbed by Gas under Influence of Alternating Currents. A. Chassy........ 226
„ required to Ionise an Atom. R. T. Beatty 1708
Flame, Acetylene-Electric. C. F. Lorenz........ 846
Geissler Tube, Temperature of Kathode and Anode in. B. Hodgson 1187
Glow Discharge from Wires, Theory of. J. S. Townsend 1332
„ „ in very Pure Gases, Observations on. G. Gehlhoff 488
„ „ , Generation of Light in, and Canal Rays. L. Vegard 113
Heated Salts, Ionisation produced by. C. Sheard 1028
„ Silver, Emission of Particles by. D. M. Shaw 1042
Heating Effect of Electric Current through Gas. A. Chassy 1478
Helium and Neon, Experiments on Electrical Discharge in. H. E. Watson 1034
„ , Absorption of, under Electric Discharge. R. J. Strutt 267
„ , Presence of, in Gas from Interior of X-Ray Bulb. W. Ramsay 1033
Hertz-Hallwachs Effect. G. Reboul 661
Hot Bodies, Absorption of Heat produced by Emission from. H. L. Cooke and O. W. Richardson 1186
„ Bodies, Quantum Theory and Emission from. W. Wilson 1985
„ Metals, Electrical Emissivity of. J. A. Harker and G. W. C. Kaye 1713
Hydrogen Tubes, Motion of Emission Centres in. A. Perot 854, 855
Ionisation and Photo-electricity of Vapours of Alkali Metals. S. H. Anderson 482
„ by Charged Particles. N. Campbell 1711
„ by Röntgen Rays. F. Lebeau 849
„ Currents, Effect of Magnetic Field on. W. Duane 495
„ in Free Atmosphere, *see* Section Static Electricity.
„ in Gases by Röntgen Radiations. C. G. Barkla and A. J. Philpot 1709
„ in Gaseous Mixtures by Röntgen Radiation. L. Simons 1857
„ of Air by Quartz Mercury Arc. L. and E. Bloch 479
„ of Potassium Vapour by Ultra-violet Light. S. H. Anderson 1026
„ Voltages in Gases. J. Franck and G. Hertz 659
„ , Columnar, Experiments on. E. M. Wellisch and J. W. Woodrow 1860
„ , Fluctuations in, due to γ-Rays. P. W. Burbidge 1861

V.16
191

.16
913

Abstract Nos

Discharge in Gases and in Vacuo (Electric), including Discharge of Condensers, *continued*.

Ionisation, Gas, by Schumann Rays. L. and E. Bloch 478
„ , Positive, produced by Platinum and Certain Salts when Heated. F. Horton 852
„ , *see also* section Dissociation and Ionisation.
Ionisations within Closed Vessels due to Röntgen and Gamma Rays. A. S. Eve 77
Ionised Air, Current Curves in. E. Wertheimer 1984
„ Gases, Kinetic Theory of. Gouy 216
„ „ , Simultaneous Action of Magnetism and Gravitation upon. Gouy, C. G. Darwin 480
Ion, Abnormal Kinetic Energy of, in Gas. F. B. Pidduck 1463
Ions in Rarefied Gas, Magnetic Separation of. A. Righi 1471
„ , Diffusion of, into Gases at Low Pressure. C. E. Haselfoot ... 217
„ , Gaseous, Number of Elementary Charges on. P. Langevin ... 1863
„ , Negative, Effect of Magnetic Force on Motion of. J. S. Townsend and H. T. Tizard 215
„ , Positive and Negative : Condensation of Water Vapour in CO_2. Besson 218
„ , Recombination of, produced by Röntgen Rays. S. J. Plimpton 848
„ , „ „ „ . H. Thirkill ... 1858
Kathode and Röntgen Rays, Relations between. R. Whiddington, A. A. Campbell-Swinton 1288
„ -ray Line, Beaded Character of. C. T. Knipp 1868
„ Rays. S. Rudberg 663
„ „ , Goldstein's Invisible. A. Wehnelt 1469
„ „ , Pressure of. E. v. Angerer 1328
„ „ , Slow, Reflection of. L. Houllevigne 484
Kathodic Sputtering. G. W. C. Kaye 1190
Light given out by Gases under Kathode Rays. E. Gehrcke and R. Seeliger 485
Lightning, *see* section Static and Atmospheric Electricity.
Low-potential Discharge, Peculiar, in Highest Vacua. R. J. Strutt 1866
Luminosity of Electric Discharge in Gases, Duration of. R. J. Strutt 859
Luminous Centres, Movement of, in Electric Discharges. A. Perot 1479
Magnetic Field : Action upon Discharge through Gases. L. T. More and S. J. Mauchly 1995
„ Rays. A. Righi 219
Matter in its Electrically Explosive State. F. E. Nipher 1864
Mobility of Ions in Dense Media. H. J. van der Bijl 1027
„ of Positive Ion at Low Pressures. G. W. Todd 847
Neon, Occurrence of, in Vacuum Tubes containing Hydrogen. J. Masson 1329
„ , Presence of, in Hydrogen after Passage of Discharge through latter. J. N. Collie and H. S. Patterson 1036, 1330
„ , Tube containing, Effect of Diameter on P.D of. G. Claude... 1994
„ „ , Absorption of Gas by Electrodes in. G. Claude 782B
Nitric Oxide, Formation of, in High-tension Arc. F. Fischer and E. Hene 890
Nuclei, Formation of, in Gases, by Ultra-violet Light. F. Bortini ... 1031
Ozone Tubes, Siemens, Electrical Quantities in. V. Ehrlich and F. Russ 1905
„ , Production of, by Lenard Rays. F. Krüger 662
Particles ejected from Atoms, Photography of. C. T. R. Wilson...... 851
Photo-effect of Potassium : Influence of Oxygen. R. Pohl and P. Pringsheim 1986
„ -effect, Normal, with Potassium Amalgams. R. Pohl and P. Pringsheim 1468
„ -effect, Selective, in Relation to Absorbed Energy. R. Pohl and P. Pringsheim 1032

Abstract Nos.

Discharge in Gases and in Vacuo (Electric), including Discharge of Condensers, *continued.*
  Photo-effects, Normal, Long-wave Limit of. R. Pohl and P. Pringsheim 1987
  Photoelectric Action, Theory of. O. W. Richardson 483
  „ Behaviour of Iron in Active and Passive State. H. S. Allen 850
  „ Cell, Rectification by. S. H. Anderson 1050
  „ Cells, Sensibility of. J. G. Kemp 1327
  „ Current in Gases, Theory of. A. Partzsch 669
  „ Effect and Planck's Quantum. P. Debye and A. Sommerfeld 1859
  „ Effect in Toluene. A. Naccari 221
  „ „ of Metallic Compounds: Influence of Valency. G. A. Dima 1324
  „ Effect, Observation of Variations of. P. Pringsheim 1988
  „ Electrons, High Velocities of. R. Pohl and P. Pringsheim 481
  „ Emission of Electrons from Calcium. R. Pohl and P. Pringsheim 1029
  „ Fatigue. A. Becker 222
  „ Phenomena of Anthracene: Relations to Fluorescence. M. Volmer 1185
  „ Phenomenon Exhibited by Liquid Sulphur Dioxide. J. Carvallo 1466
  „ Properties of Thin Platinum Films. J. Robinson 1030
  Photo-electricity, Penetration in. A. Partzsch and W. Hallwachs 1325
  „ -electrons, Velocities of. A. L. Hughes 1464
  Photographic Plates, Effect of Low-potential Current upon. H. V. Gill 1993
  Plane-Sphere System, Electric Loss in, in Air. A. Guillet and M. Aubert 666
  Point-plane Discharge, Potential Measurements in. [Miss] P. M. Borthwick 227
  Positive Electricity, Rays of. J. J. Thomson 1862
  „ Rays. W. Wien 112
  Potential Disturbances due to Sounds in Lighted Positive Column. R. Reiger 1333, 1334
  Pseudo-resonance, Electric, Phenomena of. G. Claude 489
  Righi's Luminous Masses. L. Amaduzzi 665
  Ring Discharge without Electrodes, Conductivity of Gases in. R. Wachsmuth 229
  Röntgen Rays, Intensity Distribution of, from Pt Antikathode. W. Friedrich 129
  Silent Discharges through Gases at Atmospheric Pressure. E. H. Riesenfeld 1865
  Spark in H.F. Circuit, Radiation and Energy Dissipation of. H. R. v. Traubenberg 862
  „ Photographs at High Pressures. A. W. Porter and W. B. Haines 1480
  Sparks caused by Closing and Breaking Circuits, Resistance of. O. E. Günther 1997
  Stratified Vacuum Discharges. E. Riecke 1188
  Striations, Influence of Space Charge on. R. Reiger 1476
  Vacuum Tubes, Hysteresis in. K. Fischer 1991
  Vapours, Salt, Conductivity of. G. C. Schmidt 1712
  Wehnelt Valve Tube, Dynamical Characteristics of. R. A. Porter 1037

Dispersion (Light).
  Air, Dispersion of, and of Carbon Dioxide. L. H. Siertsema 1266
  Anomalous Dispersion in Sodium Vapour. D. Roschdestwensky 70
  Dispersion, Absorption and Fluorescence of Light. B. Söderborg 1420
  Fluorite, Dispersion of, in Infra-red. F. Paschen 1438

For the Explanation of this Index see p. 697.

V.1
191

.16
913

Abstract Nos.

Dispersion (Light), *continued.*
Halogens, Ozone, Steam, and Ammonia, Dispersion of. C. and M. Cuthbertson 1642
Mercury Vapour, Selective Dispersion of. R. W. Wood 968
Metals, Dispersion of. L. P. Wheeler 1270
Prisms, Deviations produced by. H. S. Uhler 1132
Rotatory Dispersive Power of Organic Compounds. I. and II. T. M. Lowry and T. W. Dickson 1652
„ Dispersive Power of Organic Compounds. III. T. M. Lowry 1653
Self-testing of Dispersion Apparatus. C. V. Burton 385
Water, Optical Properties of Ions in. A. Heydweiller 581

Dissociation and Ionisation.
Cryoscopic Measurements, *see* section Freezing-, Melting-, and Boiling-Points.
Dissociation Isotherms of Sulphur, Selenium, and Phosphorus. G. Preuner and I. Brockmöller 1908
„ of Oxides, Carbonates, and Sulphides. W. Hempel and C. Schubert 294
„ of Strong Electrolytes, Activity of Ions and. G. N. Lewis 892
„ Pressures of System Copper—Cuprous Oxide. R. E. Slade and F. D. Farrow 739
Flame, Acetylene-Electric. C. F. Lorenz 846
Ionisation and Law of Mass Action. W. R. Bousfield 1105
„ by Kathode Rays and Chemical Effects, Relation between. E. Jacot 893
„ in Gases by Röntgen Radiations. C. G. Barkla and A. J. Philpot 1709
„ of Sulphuric Acid in Dilute Solution, Mode of. J. A. Muller 740
„ of the Atmosphere, *see* section Static Electricity.
Ions, Negative and Positive, Lack of Symmetry of. Besson 218
Phosphorus Fog Particles, Phosphorus-content of. K. Przibram ... 110

Dynamics and General Mechanics.
A. Einstein's Theorem. E. M. Lémeray 335
Aerodynamics. A. Lechner 916
Aeronautical Committee, Government, Work of 582B
Air Eddies, Suspension of Particles in. W. Schmidt 1782
„ Flow, Resistance to, in Pipes. A. H. Gibson 13
„ -resistance. W. König 341
Continuous Media, and P. Appell's Equations. E. Guillaume 921
Co-ordinate Systems of Dynamics. E. Gehrcke 1118
Explosive Wave, Propagation of, in Solids. J. Taffanel and H. Dautriche 160
Flow of Anisotropic Liquids in Magnetic Field. M. W. Neufeld ... 1771
„ of Incompressible Viscous Fluid, Stability of. A. H. Gibson ... 552
„ Process, Experiments on, in Divergent Channels. H. Hochschild 1384
„ , Fluid, Laws of. V. Kaplan 15
„ , Stationary, of Compressible Fluids. O. Janzen 1772
Fluids, Energy Law for. D. Bánki 553
Friction, External, of Gases. W. Gaede 1245
Frictionless Liquid, Two-dimensional Motion of. W. B. Morton ... 1776
Gravitation Field, Einstein's Stationary. P. Ehrenfest 1583
„ , Four-dimensional, Theory of. J. Ishiwara 909
„ , Theory of. M. Abraham 331
„ , „ G. Pavanini 332
Gyrostatic Action. J. W. Milnor 350
„ „ , Novel Illustrations of. J. G. Gray 158
Ice Friction under Pressure. H. Morphy 545
Impact, Oblique, of Two Confined Streams of Water. A. H. Gibson 550

For the **Explanation** of this Index see p. 697.

Abstract Nos.

Dynamics and General Mechanics, *continued.*
Impulsive Thrusts in Pipes having varying Diameters. de Sparre ... 1383
" Kilogramme " as Unit of Force. E. Budde, K. Strecker ... 758
Linear Space-time Transformations. K. Kraft ... 329
Liquid, Viscous, Motion of, due to Uniform and Periodic Motion. W. J. Harrison ... 555
Longitudinal and Transversal Masses. P. Frank ... 29
„ and Transverse Mass. J. Ishiwara ... 549
Mechanics, Non-Newtonian. R. C. Tolman ... 548
Minkowski's Mechanics. F. J. de Wisniewski ... 763, 1119
„ " World," Space-time Lines in. F. Kottler ... 765
Motion of Disc on Rough Plane. P. Field ... 4
„ of Viscous Fluid under Rotating Plate. H. Sanders ... 16
„ , Steady and Turbulent, in Gases. J. J. Dowling ... 14
Nozzles, Flow of Gases from. G. Forner ... 1041B
Oscillations about Position of Equilibrium. H. J. E. Beth ... 1775
Projectile, Exit of, from Mortar ... 12
Relativity and Gravitation. G. Nordström ... 354
„ and Kinematics. E. Borel ... 767
„ and Mechanical Views of Radiation. M. La Rosa ... 355
„ and Uniform Rotation. J. W. Nicholson ... 330
„ Equations. C. Cailler ... 764
„ Mechanics, Inertia and Weight Masses in. G. Nordström 1250
„ Principle and Law of Central Forces. Lémeray ... 334
„ Theory. J. Petzoldt ... 353
„ „ , Ponderomotive Forces in. M. Laue ... 920
„ , and Principle of Least Action. E. Henschke ... 1252
„ , Mass, Force, and Energy. R. D. Carmichael ... 755
„ , Philosophical Aspects of. R. D. Carmichael ... 917
„ , Quaternionic. L. Silberstein ... 547
„ , Space-Time Manifold of. E. B. Wilson and G. N. Lewis 328
„ , Theory of. R. D. Carmichael ... 19
Resistance of Air to Motion of Inclined Planes. L. Mina ... 119B
„ of Spheres in Moving Air. G. Eiffel ... 465B
„ to Motion of Body in Fluid. T. v. Kármán ... 28
Spiral, Double, Friction and Isochronism of. J. Andrade ... 1242
Stable System, Approximate Determination of Period of. A. Mallock 1382
Suction behind Ships. Poincet ... 342
Turbulence, Gaseous: Influence of Temperature. C. Schaefer and G. Frankenberg ... 752
Velocity Distribution of Air near Wire moving Lengthwise. K. Przibram ... 1251
Vortices, Alternate, Zone of Formation of, behind Obstacle. H. Bénard ... 911, 1116
„ , Cellular, New Species of. C. Dauzère ... 1117
" Water-hammer," Theory of Phenomenon known as. L. Allievi ... 922
Waves, Deformation and Interference of, in Gases. L. Crussard ... 760
„ , Ocean; Sea-beaches and Sandbanks. V. Cornish ... 923
Wind Velocity, Distribution of, about Circular Rod. J. T. Morris ... 1777

Elasticity, *see also* section Metallography.
Bars, Compound, Euler's Breaking Formula for. A. Lechner ... 352
Beam, Relation between Deflection of, and Internal Stresses. A. Rejto ... 745
Beams, Curved, and Strength of Hooks ... 1926
„ , Theory of. Hisely ... 327
Bismuth Wires, Elastic Properties of. J. E. Harris ... 5
Columns, Taper, Theory of. W. M. Wallace ... 157
Crystals, Elasticity of. T. Reimers ... 1108
Cylinders, Thick, Resistance of, to Rupture. Malaval ... 746
Fatigue, Thermoelectric, as Method of Testing. T. R. Lawson and J. A. Capp ... 907
Girder, Bow, Equilibrium of. A. H. Gibson ... 351

V.16
1913

.16
913

Abstract Nos.

Elasticity, *continued.*
Ice, Elasticity of. K. R. Koch 1575
„ , Properties and Structure of. R. S. Tarr and J. L. Rich........ 1243
Indiarubber, Elongation of. S. Ono 1380
Load-extension Diagrams taken with Optical Indicator. W. E. Dalby 1378
Notched Tension Bars, Stress Distribution in. E. Preuss........ 1110
Oscillations, Equivoluminal, in Metals, Law of. W. Peddie 9
Plastic Flow, Law of. C. E. Larard 903
Plates, Flat, Elastic Strength of. W. J. Crawford, C. G. Knott 148
Platinum-Iridium Wires, Elastic Peculiarities of. L. P. Sieg 147
Poisson's Ratio, Determination of. I. Williams 317
Quartz Glass, Elastic Constants of. F. Stumpf 1239
Rigidity of Phosphor-bronze, Anomalous Variation of. H. Pealing 904
Riveted Joints, Stresses in. C. Bach and R. Baumann 10
Sand Foundations, Stress Distribution and Manner of Failure in. O. Strohschneider 319
Shearing Deformation, Reflection of, at Boundary of Two Liquids. A. Finzel........ 1774
Shells, Thin, Elasticity of. E. Meissner........ 1240
Sodium and Potassium, Stretching and Breaking of. B. B. Baker... 1768
Solids and Liquids, Mechanical Properties of. A. Mallock 318
Steel, Dilatation of. W. Block 191
Stress, Circular Diagram of, Theory of Internal Friction. O. H. Basquin 149
„ , Distribution of, due to Rivet in Plate. E. G. Coker and W. A. Scoble 1773
„ -distribution in Cylindrical Vessels with Variable Cross-section. T. Pöschl 156
Structures, Predetermination of Stresses in. Mesnager........ 322
Struts, Strength of. R. V. Southwell 7
„ , Tensile Yield-point and Collapsing Load of. O. Greger 751
Suspensions, Hysteresis of. O. Venzke 26
Telescope Mirror-discs, Flexure of. H. S. Jones........ 1581
Tension Members, Effects of Holes on Distribution of Stress in. E. G. Coker 906
Theory of Elasticity. H. Lorenz........ 540
„ „ . T. v. Kármán 1109
Tie-rods, Drilled, Stress Distribution in. E. Preuss 8
Torsional Oscillation, Application of Law of. J. B. Ritchie 1924
„ „ , Fuller Test of Law of. J. B. Ritchie 1923
„ Oscillations of Wires; Deviation from Isochronism. W. Peddie........ 1925
Tubes, Collapse of, by External Pressure. R. V. Southwell 1241
Vibrations, Transverse, of Rod of Varying Cross-section. P. F. Ward 554
Water Conduits, Deformation of. C. Guidi 722B
„ „ , Elastic Deformation of. G. Colonnetti 321
Welded Joints in Iron and Steel: Fatigue Properties. T. E. Stanton and J. R. Pannell 6

Electric Furnace Processes.
Alumina-Fluorite-Cryolite System. Electrometallurgy of Aluminium. P. Pascal and A. Jouniaux 2014
Aluminium Nitride, Formation of, from Alumina, Coal, and Nitrogen. W. Fraenkel 1907
Calcium Boride. E. Wedekind 1893
Carbides, Molybdenum and Tungsten, Preparation of. S. Hilpert and M. Ornstein 1746
Carborundum Furnace. W. D. Bancroft, L. V. Walker, and C. F. Miller 1527
Diamonds, Production of, in Electric Furnaces. F. P. Mann 1526
Industrial Processes, *see* Section B.
Vacuum-furnace Metallurgy. C. G. Fink 1213

V.16
1913

Abstract Nos.

Electrolysis.

Action of Electrolytes on Metals subjected to Stresses. H. Bancke 733

Aluminium Anode-films, Temperature-variation of Conductivity of. G. E. Bairsto 298

Analysis, Separation, and Estimation (Electrolytic), *see* section Electrolytic Analysis.

Brass and Bronze, Electro-deposition of. C. W. Bennett 2021

Cadmium, Electrochemical Equivalent of. J. S. Laird and G. A. Hulett 1230

Calcium and Calcium Alloys, Electrolytic Preparation of. W. Moldenhauer and J. Andersen 1756

Chlorination of Benzene in Electrolytic Cell. R. G. Van Name and C. H. Maryott 1106

Chromic Acid, Electrolytic Regeneration of, from Sulphate Solutions. P. Askenasy and A. Révai 1754

Cobalt and Nickel, Electro-deposition of. O. P. Watts 2017

Colloids, Influence of, on Electrolysis (Lead and Zinc). R. Marc 1919

Copper and Carbon, Co-precipitation of, by Electrolysis. E. B. Spear, C. Chow, and A. L. Chesley 1232

„ , Colloidal, Electrochemical Production of. T. R. Briggs 1921

„ , Electro-deposition of. C. W. Bennett 2020

„ , Electrolysis of Nitric Acid Solutions of. J. H. Stansbie 1916

„ -Sulphate Solutions, Concentration-changes in Electrolysis of. C. W. Bennett and C. O. Brown 1373

Corrodibility of Iron, Influence of Various Elements on. C. F. Burgess and J. Aston 1228

Corrosion of Iron by Sulphuric Acid in Presence of other Substances. O. P. Watts 1227

„ of Iron, Electrolytic Method for Prevention of. J. K. Clement and L. V. Walker 305

„ of Iron, Electrolytic Theory of. B. Lambert 1909

„ , Iron, Prevention of, by Counter E.M.F. J. K. Clement and L. V. Walker 1226

Dichromate, Electrolytic Formation of, from Chromate. E. Muller and E. Sauer 304

Electrode $Cu/Cu^{\cdot\cdot}$, Reversible. D. Reichinstein, A. Bürger, and A. Zieren 302

Electrolytic Processes. E. Grimsehl 896

Faraday, Value of, and Iodine Coulombmeter. E. W. Washburn and S. J. Bates 301

Gold and Silver, Electro-deposition of. F. C. Frary 2016

Hg-Cu and Ag-Cu, Alloys, Anodic Behaviour of. D. Reichinstein, A. Bürger 1912

High-tension Electrolysis: Method of Measuring High-voltage Currents. W. W. Strong 2022

Industrial Electrolysis, Plating and Refining, *see* section B.

Lead, Deposition of: Influence of Colloids. H. Freundlich and J. Fischer 140

„ , Electro-deposition of. F. C. Mathers 2018

„ Plating Baths: Effect of Addition Substances. F. C. Mathers and O. R. Overman 1233

Membrane, Semipermeable, of Copper Ferro-cyanide, Properties of, R. Beutner 1371

Overvoltage. J. W. Richards 1913

„ , Kathode, Factors determining. J. N. Pring 1566

Passive State of Iron. J. MacLeod Brown 897

„ „ „ , Relation between Magnetic Field and. H. G. Byers and S. C. Langdon 1564

Passivity of Iron under Boiler Conditions. H. G. Byers and F. T. Voris 303

„ of Lead and Lead Sulphide Electrode. P. P. Lebedew 300

For the Explanation of this Index see p. 697.

7.16
.913

Abstract Nos.

Electrolysis, *continued*.
Passivity of Metals and its Dependence upon Solvent. N. Isgarischew ... 1917
Polarisation, Electric, and Electrolysis, Time-lag between. A. Grumbach ... 898
„ (Electrolytic), *see also* separate section.
Radio-active Elements, Electrochemical Properties of. K. Fajans 1078
„ Substances, Electrolysis of. K. F. Herzfeld ... 895
Reactions taking place at Kathode and Anode during Electrolysis. J. H. Paterson ... 138
Rectifier, Electrolytic, *see also* section Polarisation (Electrolytic).
Rusting of Iron and Steel, Rate of. J. Aston and C. F. Burgess ... 1361
Silver, Black. Form of Deposited Metals. V. Kohlschütter, T. Toropoff, W. Pfander, and H. Schacht ... 1915
„ , Electrolytic, Inclusions in: Effect on Electrochemical
„ , Equivalent. J. S. Laird and G. A. Hulett ... 1229
„ Iodide. Electrolysis of Crystalline Compounds. G. Bruni and G. Scarpa ... 1231
Sulphur Dioxide, Liquefied, Electrolysis in. L. S. Bagster and B. D. Steele ... 299
Tantalum as Kathode Material. G. Oesterheld ... 1918
Tin, Electro-deposition of. E. F. Kern ... 2019
Uranium X, Electrochemical Properties of. P. Rossi ... 899
Valve Action, Electrolytic, of Niobium. U. Sborgi ... 1914
Valves, Electrolytic, Minimum Voltage of, in Permeable Direction. G. Schulze ... 1565
Voltameter, Silver. E. B. Rosa, G. W. Vinal, and A. S. McDaniel 501, 675
„ „ . G. D. Buckner and G. A. Hulett ... 1200

Electrolytic Analysis.
Copper, Antimony, Bismuth, and Tin, Electro-analysis of. E. P. Schoch and D. J. Brown ... 1372
„ , Electrolytic Separation of, from Tungsten and Molybdenum. W. D. Treadwell ... 1755
Rapid Electro-analysis under diminished Pressure. F. Fischer and E. Stecher ... 139
Silver-Bismuth Alloys, Electrolytic Refining of. W. N. Lacey ... 610B
Tin, Electrolytic Separation of, from Tungsten. W. D. Treadwell ... 1920

Electromagnetic Theory.
Accelerated Conductors, Electromotive Force of. R. C. Tolman ... 836
Atomic and Molecular Charges. F. Sanford ... 207
„ Charges and Specific Inductive Capacity. F. Sanford ... 1705
Atom, Radiating, Model of. K. F. Herzfeld ... 205
Atoms, Multiply-charged. J. J. Thomson ... 206
Brownian Motions in Gases at Low Pressures. R. A. Millikan ... 840
Charges on Metallic Dust. A. Mayer ... 466
Condenser, Circular Plate. H. Thirring ... 1455
Conduction, Electric, by Free Electrons. P. Lenard ... 1180, 1320
„ „ , in Metals. W. Wien ... 653
Dispersion, Plane. C. Schaefer and H[elene] Stallwitz ... 1854
Electrified Particle in Magnetic Field. R. Birkeland ... 105
„ Particles, Decrease of Speed of, on passing through Matter. N. Bohr ... 651
Electromagnetics and Relativity. S. J. Barnett ... 1022
Electronic Charge and Stokes' Law. J. Roux ... 477
„ „ „ „ . A. Schidlof and [Miss] J. Murzynowska ... 843
„ Charge, Drop Method for. A. C. Lunn ... 104
„ Mass, Variation of. J. Kunz ... 841
Electron Orbits. C. G. Darwin ... 838
„ Theory of Metals. K. F. Herzfeld ... 1322
„ , Dynamics of. A. Signorini ... 650

Abstract Nos.

Electromagnetic Theory, *continued.*
  Electrons and Gas Molecules, Slow, Collisions of. J. Franck and G. Hertz 1853
    „ , Born's Rigid, Rectilinear Motion of. W. Behrens and E. Hecke 845
    „ , Moving, Magnetic Force on. L. de la Rive 204
    „ , Photoelectric, Charge of. E. Alberti 837
    „ , Photoelectrically-liberated, Initial Energies of. H. J. van der Bijl 1321
    „ , Slow, and Gas Molecules, Collisions between. J. Franck and G. Hertz 1319
    „ , Speed of, in Photoelectric Effect. D. W. Cornelius 839
  Equilibrium between Oscillators, Free Electrons, and Radiant Heat. M. Planck 1021
  Force Exerted on Magnetic Particle by Electric Field. J. G. Leathem 1882
  Gravitation and Electricity. G. Borelius 756
  Induction, Electromagnetic, and Relative Motion. S. J. Barnett 210
    „ , Law of, and Electron Theory. K. Pichelmayer 1181
    „ , Unipolar, and Condenser Rotating in Magnetic Field. E. H. Kennard 209, 1179, 1454
  Lorentz Transformation, Coefficients of. C. Kraft 208
  Magnetic Insulator Rotating in Magnetic Field, Electric Effect of. M[arjorie] Wilson and H. A. Wilson 1982
  Moving Bodies, Relativity Theory for. R. Grammel 1459
    „ Point Charge, Electro-Magnetic Potential of. M. Francesco 1461
  Nuclei Charges. K. Przibram 467
  Phosphorus Fog Particles, Phosphorus-content of. F. Przibram ... 110
  Possible Changes in Momentum of Charged Condenser. P. G. Agnew and W. C. Bishop 652
  Problems relating to Potential, Approximate Solution of. Rayleigh 1707
  Rotating Bodies, Magnetic Effect of. P. Lebedew 465
  System of Parallel Conductors, Electric and Magnetic Fields of. O. Colard 120
  Trajectory of Luminous Rays in Gravitational Field. B. Caldonazzo 1460

Electro-Physiology and Radiology.
  Alternating Magnetic Field, Physiological (Retinal) Effect of. H. L. Jones 2009
  Opacity to X-Rays of Fabrics impregnated with Lead Salts. L. G. Droit 265
  Radiography, Use of very Soft Röntgen Rays in. T. Nogier 878
  Röntgen Rays, Distribution of, from Pt Antikathode. W. Friedrich 129
  Ruhmkorff Coil: Influence of Number of Interruptions on Output. Nogier and Regaud 1738
  Spark Inductors and Röntgen Tubes. F. Dessauer 522
  X-rays, Hard. F. Dessauer 1208

Freezing-, Melting-, and Boiling-Points.
  Boiling-points of Nitrogen Trioxide and Tetroxide, change in, on Drying. H. B. Baker and M. Baker 452
  Melting- and Boiling-points; Physical Constants of Sulphur Trioxide. D. M. Lichty 453
    „ -point of Cupric Oxide. R. E. Slade and F. D. Farrow 90
    „ -points of Alkaline Metals. E. Rengade 1690

Gases and Vapours.
  Adsorption by Heated Charcoal. K. Arndt and G. Schraube 1888
    „ of Gases by Carbon and other Porous Substances. W. Hempel and G. Vater 130
  Ammonia Vapour, Saturated and Superheated, Properties of. G. A. Goodenough and W. E. Mosher 1224B
  Argon, Calculation of Thermal Quantities for. H. K. Onnes and C. A. Crommelin 1171
    „ , New Method of Preparing. J. Stark 1521

V.16
1913

7.16
1913

Abstract Nos.

Gases and Vapours, *continued.*
  Argon, Rectilinear Diameter for. E. Mathias, H. K. Onnes, and C. A. Crommelin 1170
  Capillary Phenomena in Gases. G. Reboul 915
  Carbon Dioxide, Solubility of, at Pressures lower than Atmospheric. A. Findlay and T. Williams 1370
  Carbonic Acid, Thermal Properties of, at Low Temperatures. C. F. Jenkin and D. R. Pye 1849
  Characteristic Equation for Gases, New Forms of. T. Peczalski 1692
  Chemical Constants of Gases. O. Sackur 880
  Chlorine and Bromine, Crystalline Properties of. W. Wahl 1740
  Compressibility of Gases and Coefficients of Expansion, Relation between. T. Peczalski 1691
  „ of Gases under Small Pressures and at Low Temperatures. W. J. de Haas 636
  Diatomic Gases, Second Virial Coefficient for. W. H. Keesom 455
  Energy-Content of Gases. W. Nernst 632
  Explosions in Mixed Gases: Limits of Inflammability. E. Jouguet 1172
  Friction, External, of Gases. W. Gaede 1245
  Helium and Diatomic Gases, Specific Heats of. K. Scheel and W. Heuse 827
  Hot Gases, Thermal Radiation from. W. T. David 1002
  Hydrogen and Oxygen, Crystallographic Properties of. W. Wahl ... 1071
  „ , Compressibility of, Control Measurements with Volumenometer. W. J. de Haas 635
  „ , Second Virial Coefficient for Monatomic Gases and for, below Boyle-point. W. H. Keesom 634
  „ Vapour, Compressibility of, at and below the Boiling-point. H. K. Onnes and W. J. de Haas 637
  Methane, Triple Point of. C. A. Crommelin 454
  Mixtures, Gaseous, Association Phenomena in. A. Schulze 1556
  „ , „ , Combustion of. Taffanel and Le Floch 1448
  Nitrogen, Active. R. J. Strutt 1745
  „ , Argon, and Methane, Crystallised, Optical Investigation of. W. Wahl 133
  „ , Oxidisable Variety of. T. M. Lowry 1887
  Quanta Theory of Gases and Liquids. H. Tetrode 1013
  „ „ , Monatomic Gases and. W. H. Keesom 1975
  Sulphur Trioxide, Physical Constants of. D. M. Lichty 453
  Tungsten Lamp, Chemical Clean-up of Nitrogen in. I. Langmuir 1890
  Viscosity and Thermal Properties of Gases. A. Eucken 1301
  „ at Low Temperatures. I. Hydrogen. II. Helium. H. K. Onnes, C. Dorsman, and S. Weber 1446
  Waves in Gases, Deformation and Interference of. L. Crussard ... 760

Gravity.
  Absorption of Gravitation. W. de Sitter 11
  Gravitation Field, Einstein's Stationary. P. Ehrenfest 1583
  Hayford Method of Gravity Reduction. W. Bowie 333
  Isostasy in Alps. A. Prey 1781
  Temperature, Effect of, in Gravity Determinations. C. Mineo 1582
  Theory of Gravitation. M. Abraham 331
  „ „ . G. Pavanini 332
  Tunis and Malta, Determination of Relative Gravity in. A. Venturi 337

Inductance (Self and Mutual).
  Measurements, *see also* separate section.
  Mutual Inductance of Coaxial Circles. J. G. Coffin 1723
  „ „ „ Solenoids. G. R. Olshausen 242
  „ „ Two Coaxial Circular Currents. H. Nagaoka 505
  „ Induction between Two Parallel Coaxial Circular Currents. E. Mathy 243
  Resistance Coils, Measurement of Inductances of. F. W. Grover and H. L. Curtis 504

For the **Explanation** of this Index see p. 697.

Abstract Nos.

Interference.
Diffraction, Gouy-Sommerfeld's. A. Kalaschnikow 1941
„ Images. J. W. Gordon 580
„ of Electric Waves by Crystal. L. S. Ornstein 1666
„ of Short Electro-magnetic Waves by Crystal. W. L. Bragg 989
Fringes of Crystalline Plates with Parallel Faces. C. Raveau 1146
„ , Superposed. Diffraction Phenomena. C. F. Brush 1810
Gratings, Non-focal Images of. M. Wolfke 795
Lummer Interference Plate. F. Koláček 405
Newton's-rings System, Corrections in. A. Ferguson 1145
Partially Silvered Plates, Interference Bands with. A. H. Pfund ... 1812
Scattering of Light. J. R. Milne 1944
Wave Equation, Solutions of. A. Wiegrefe 69
Wedge-shaped Plates, Interference with. L. Janicki 975
„ „ , Sharp Interference Bands with. E. Gehrcke and L. Janicki 55
Wedges, Glass, Interference Phenomena in. E. von der Pahlen ... 389

Magnetism.
Antimony Alloys, Magnetic, with Tin and Lead, Study of. P. Leroux 1512
Apparatus and Instruments, *see also* separate section.
Boron, Alloys of Iron and Manganese with, Magnetic Properties of. A. B. du Jassonneix 1513
Changes in Iron and Steel at High Temperatures. K. Honda and H. Takagi 516
Claywares, Magnetic Materials in. A. Hopwood 1880
Crystals, Kinetic Theory of Paramagnetism of. P. Weiss 1518
Cyclic Magnetisation superposed on Constant Magnetisation. H. Hoffmann 614B
Demagnetisation Factors of Elliptic Cylinders. H. du Bois 1349
Diamagnetism, Additivity of, in Compounds. P. Pascal 873
Disappearance of Ferro-magnetism under Short Electric Waves. W. Arkadief 1732
Effect of Magnetic Fields on Resistance. C. W. Heaps 1044
Elasticity and Magnetism. F. J. Kean 470B
Electromagnet with Ferro-cobalt Pole-pieces. P. Weiss 1511
„ , Distribution of Magnetic Field between Poles of. A. Marchetti 1066
Electromagnetic Theory, *see* separate section.
Electron Theory of Magnetism. E. H. Williams 876
Force Exerted on Magnetic Particle by Electric Field. J. G. Leathem 1882
Graphite, Effect of Transverse Magnetisation on Resistance of. D. E. Roberts 117
Hall-effect. J. Koenigsberger and G. Gottstein 1204
„ . A. W. Smith 1514
„ and Change in Resistance in Magnetic Field at Low Temperatures. H. K. Onnes and B. Beckman ...694, 695, 696, 697, 1351
„ at Low Temperatures. H. Alterthum 508, 1065
„ for Alloys at Boiling-point of Hydrogen. H. K. Onnes and B. Beckman 698
„ for Gold-Silver Alloys at Melting-point of Hydrogen. B. Beckman 1352
„ in Antimony. J. Becquerel, L. Matout, and [Miss] W. Wright 1067
„ in Liquid Electrolytes. A. E. Oxley 1881
„ in Tellurium and Bismuth at Low Temperatures. H. K. Onnes and B. Beckman 1353
„ , Theoretical Contribution to Methods of Measuring. F. Koláček 514
Heusler Alloys. F. Heusler and E. Take 255
„ „ . A. D. Ross 256
„ „ . A. A. Knowlton and O. C. Clifford 257

V.1
191

7.16
.913

Abstract Nos.

Magnetism, *continued.*
  Heusler Alloys, Magnetisation of, as Function of Temperature. P. W. Gumaer ... 517
  Hydrates, Solid, of Copper and Chromium, Magnetic Properties of. Mlle. E. Feytis ... 1205
  Hysteresis Loop and Index. W. M. Thornton, L. W. Wild ... 1203
    „ of Iron under Electrical Oscillations. H. Fassbender and E. Hupka ... 128
    „ , Effect of Rapidity of Variation of Field on. A. Schidlof and Mlle. C. Chamié ... 1510
    „ , Magnetic, Measurement of Work Absorbed by. G. Lignana ... 1064
    „ , Magnetic, Theory of. G. Vallauri ... 875
  Internal Force in Ferromagnetic Bodies placed in Magnetic Field. F. Piola and L. Tieri ... 252
  Kerr-effect, Magnetic. W. Dziewulski ... 1517
    „ Magneto-Optic Effect in Ferromagnetic Compounds. P. Martin 260
    „ -Rotation for Transverse Magnetic Fields. L. R. Ingersoll ... 261
  Kinetic Theory of Magnetism. E. Schrödinger ... 689
  Magnet, Kew, Temperature Coefficient of. G. A. Shakespear ... 2007
  Magnetic Field Intensity, Measurement of. W. Rogowski and W. Steinhaus ... 126
    „ Rotation, Optical, *see* section Polarisation.
  Magneto-chemistry of Certain Ferric Salts. B. Cabrera and E. Moles 1519
    „ -optical Parameters of Iron and Nickel. C. Snow ... 1879
  Magnets, Theory of. S. B. McLaren ... 2006
  Manganese, Manganese-Copper, and Chromium, Magnetisation of. K. Ihde ... 1731
  Maximum Value of Magnetisation in Iron. B. O. Peirce ... 1507
  Measurements, *see* separate section.
  Molecular Magnetism. P. Weiss ... 704
    „ Structure and Magnetism. E. Holm ... 691
  Moment, Mean Magnetic, of Vibrating Magnet. J. R. Ashworth ... 1063
  Mutual Action of Two Magnets placed in any Position. A. Schmidt ... 705
  Nickel, Initial Susceptibilities of, at Low Temperatures. A. Perrier and H. K. Onnes ... 263
  Oscillatory Discharge, Magnetic Behaviour of Iron and Nickel under. E. W. Marchant ... 1348
  Paramagnetism at Low Temperatures. H. K. Onnes and E. Oosterhuis ... 693
  Permanent Magnets, Demagnetisation and Recovery of. S. Sano ... 692
    „ „ , Magnetism of. S. P. Thompson ... 469B
  Permeability, Magnetic, Method of Measuring. W. H. F. Murdoch 1883
    „ , Null Method for Measuring. G. Guastalla ... 1065B
  Polar Armatures. H. du Bois ... 700
  Quenching, Effect of, on Magnetic Properties of Metals. K. Honda 127
  Remanent Magnetism, Dependence of, on Temperature. A. Perrier 1508
    „ „ , Loss of, during Heating. F. Robin ... 830B
  Residual Magnetism, Stability of. N. H. Williams ... 1515
  Screens, Multi-lamellar Magnetic. W. Esmarch ... 513
  Steel, Relation between Magnetic Properties of, and Temperature ... 467B
  Steels, Nickel and Manganese, Magnetic Properties of. E. Colver-Glauert and S. Hilpert ... 258
    „ , Special, Magnetic Properties of, at Low Temperatures. J. G. Gray and A. D. Ross ... 259
  Strong and Uniform Magnetic Fields, Production of. H. du Bois ... 1354
  Studies, Magnetic. S. R. Williams ... 253
  Subsequent Magnetism of Iron. A. Bernini ... 125
  Susceptibility, Absolute, of Liquids. W. J. de Haas and P. Drapier 690
    „ , Formulae employed in Determinations of. A. Guillet 1350
    „ , Magnetic. II. Aqueous Solutions. A. E. Oxley ... 1206

Abstract Nos.

Magnetism, *continued.*
- Susceptibility of Alloys. Antimony-Bismuth and Antimony-Zinc. K. Honda and T. Soné 872
- „ of Iron, Steel, Nickel, and Cobalt at High Temperatures. K. Honda and H. Takagi 699
- Terrestrial Magnetism, *see* separate section.
- Theory of Magnetism. H. A. Lorentz 703
- Thermomagnetic Study of Steel. S. W. J. Smith 515
- Thermo-magnetism, *see* section Thermo-electricity.
- Torsion, Variation in, produced in Iron and Nickel Wires by Alternating Magnetic Field. G. Ercolini 1509
- Vanadium Steel, Magnetic Properties of. J. J. Lonsdale 1730
- Viscosity, Magnetic. W. Luthe 1516
- Water and Oxygen, Coefficient of Magnetisation of. P. Weiss and A. Piccard 518
- „ and Oxygen, Coefficient of Magnetisation of. A. Piccard 1736
- „ , Constitution of. A. Piccard 519
- „ , Determination of Magnetisation Coefficient of. P. Sève 874

Measurements and Use of Instruments.
- Absorption, Light, Spectropolariscopic Method for Investigating. N. Umow 169
- Actinometer Measurements, Correction of, for Aqueous Depletion. F. W. Very 1585
- Air-pump, Molecular. W. Gaede 1763
- Ampere, International, Determination of, in Absolute Measure. E. B. Rosa, N. E. Dorsey, and J. M. Miller 499
- Argon, New Method of Preparing. J. Stark 1521
- Attraction between Coaxial Solenoids carrying Current. G. R. Olshausen 1506
- Azimuth Marks of Cape Transit Circle. D. Gill 1572
- Black Body, Wedge-shaped Cavity Used as. B. J. Spence 1305
- Brittleness Test, Notes on. M. Derihon 750
- Calibrating Barometer and Thermometer Tubes, Optical Method for. S. W. Wicksell-Gyllenberg 1376
- Calorimeter, Anethol. U. Grassi 1444
- Calorimetry, Thermoelectric Methods in. W. P. White 1451
- Capacity of Coils, Determination of. W. Hüter 678
- Carbon Contacts, Study of Resistance of. A. L. Clark 1049
- Chemical Problems; Further Applications of Positive Rays. J. J. Thomson 1210
- Christiansen's Phenomenon, Liquid Mixtures for observing. F. Bodroux 969
- Chronometer, Deformation Law of Spring of. M. Moulin 1379
- „ , Marine, Balance Wheel of. J. Andrade 1381
- Circle-dividing Machines, Test of. G. Foerster 743
- Colour, Measurement of. A. C. Jolley and A. J. Bull 582
- Comparator, Large. W. Kösters 143
- Conductivities, Thermal, Electrical Method of Comparing. W. Eves 1228B
- Conductivity for Heat, Method of finding. C. Niven and A. E. M. Geddes 624
- „ , Electrical, of Solutions. H. Hartley and W. H. Barrett 1560
- Converter, Electric. W. I. Book 1878
- Coulombmeter, Iodine, and Value of the Faraday. E. W. Washburn and S. J. Bates 301
- Crystal Space Lattices. A. E. H. Tutton, W. H. Bragg 266
- Damping, Measurement of, in Oscillation Circuit. F. Kiebitz 493
- Decrement Paper. L. Isakow 1335
- Densities of Powdered Minerals, Determining. M. Billy 902
- Dielectric Constants of Solid Bodies. E. Grüneisen and E. Giebe 509
- Diffusion of Dissolved Substances, New Method for determining. L. W. Öholm 1097

For the **Explanation** of this Index see p. 697.

V.1
191

7.16
.913

Abstract Nos.

Measurements and Use of Instruments, *continued.*

Disintegration, Electrical, of Metals: Use as Method of Testing. C. Benedicks 679
Dispersion Apparatus, Self-testing of. C. V. Burton 129
Earth's Rotation Demonstrated. A. H. Compton 1257
„ „ , Perrot's Experiment to Establish. O. Tumlirz ... 757
Electrometer Needle, Method of Charging. A. H. Erikson 868
„ , Quadrant, Motion of Needle of. W. F. G. Swann...... 244
„ , „ , Use of, for Measuring Large Resistances. P. Vaillant 869
„ , Vibration: Application to A.C. Measurement. H. Greinacher 1346
Equatorials, Photographic, Orientation of. E. Esclangon 33
Expansion, Measurements of, with Abbe-Fizeau Dilatometer. W. Bein 88
Flexure, Horizontal, of Meridian Instruments. B. Baillaud.......... 1762
Focometer, Abbe. H. Fassbender 1808
Fourier's Theorem, Application of, to Physical Problems. Rayleigh 339
Function, Arbitrary, Spectroscopic Resolution of. C. V. Burton ... 1780
Galvanometer, Ballistic. T. J. I'a Bromwich 1501
Galvanometers, Vibration. H. F. Haworth 1877
„ , „ , with Unifilar Control. A. Campbell 1202
Harmonic Analysis, Process for. R. Slaby 1078B
Heats of Solution of Metals, Determination of. E. E. Somermeier... 1010
High-frequency Circuits, Cause of Error in Measurements with. S. Loewe 450B
„ -voltage Currents, Method of Measuring. W. W. Strong......... 2022
Hydroelectric Machines. A. Bernini 249
Hydrogen Electrode, Applications of. J. H. Hildebrand 1750
Hydrometers, Standardisation of. R. T. Glazebrook 1570
Inductance and Capacity, Method of Comparing. W. E. Forsythe 1724
„ , Measurements of. A. O. Allen 1199
Inductances of Resistance Coils, Measurement of. F. W. Grover and H. L. Curtis 504
Induction Balance, Energetics of. J. P. Dalton 867
„ , Mutual, Measurement of. F. Kock 121
Interference Bands, Sharp, with Wedge-shaped Plates. E. Gehrcke and L. Janicki 55
"Kilogramme" as Unit of Force. E. Budde, K. Strecker.......... 758
Length Standard and Thermal Expansion of Copper. G. F. K. Langbein 146
Lightning Conductors, Horned. H. Greinacher 1024
Longitude Determination by Wireless Telegraphy. H. Renan 1573
„ , Difference of; Measurement by Radio-telegraphy. B. Baillaud 1767
Magnetic Field Intensity, Measurement of. W. Rogowski and W. Steinhaus 126
„ Fields, Strong and Uniform, Production of. H. du Bois 1354
„ Screens, Multi-lamellar. W. Esmarch.................... 513
Measuring Apparatus, Bessel's. P. Thomas 142
„ Machine, Standard. P. E. Shaw 144
Mechanical Equivalent of Heat; Porous Plug Method. J. R. Roebuck 1971
Mercury Lamps, Quartz, New Construction for. A. Tian.......... 1053
Meteorological Observations, Errors in, having Psychological Origin. G. Hellmann 924
Micro-photometer, Registering. P. P. Koch.................... 400
Microscope Preparations, New Mounting for. C. Cépède.......... 1126
Mirror Readings, Improvements in. J. Ludwig 1569
Mirrors, Formation of, by Scattering due to Kathode Rays. G. Rümelin 790
„ , Silver, Preservation of. L. Bell 1650

V.16
1913

Abstract Nos.

Measurements and Use of Instruments, *continued.*
Nephoscope, Perspective, Substitution of Theodolite for. A. Lo Surdo ... 919
Objective-testing Apparatus, Hartmann. H. Fassbender ... 1421
Oil-drop Method of Studying Electrical Phenomena. R. A. Millikan 1062
Pendulum Observations, Influence of Support on. E. Esclangon ... 910
Periodic Curves, Analysis of. S. Silbermann ... 1075B
„ Phenomena, Electrical Measurement of. G. Lippmann ... 316
Photoelectric Cells, Sensibility of. J. G. Kemp ... 1327
Photometers, Polarisation, Limits of Application of. V. Návrat ... 794
Poisson's Ratio, Determination of. I. Williams ... 317
Potentials, High, Attainment of, by Use of Radium. H. G. J. Moseley 1872
Pressure-differences, Small; Tilting Manometer. J. R. Pannell ... 1759
„ , True Static, Measurement of, in Moving Fluid. A. F. Zahm 1120
Psychrometric Formula. G. Smeal ... 443
Quantometer, Effective Capacity of Electrometer when used as. R. Beattie ... 680
Radiation Constant. L. Puccianti ... 196
Radio-telegraphic Signals, Received, Measurement of. L. W. Austin 564B
Radium Emanation, Quantitative Determination of. L. Flamm and H. Mache ... 75
„ Emanation, Units of Quantity of. J. and G. Danne ... 183
„ Preparations, Vienna Standard. S. Meyer and V. F. Hess 76
„ , Standard, International. Mme. P. Curie ... 78
Recording, Photographic, of Ballistic and other Rapid Phenomena. C. Cranz and B. Glatzel ... 245
Rectangular Glass Plate, Koschwitz. K. Lüdemann ... 315
Rectification of Photoelectric Cell. S. H. Anderson ... 1050
Rectifier, Mercury, Behaviour of, under High Frequency. H. Busch 1869
Reflectors, Optical, Method of Testing. J. Rey ... 1806
Refractive Index Determinations with Microscope. H. E. Merwin 792
„ Indices of Liquids; Diffraction Grating Method. F. A. Osborn and H. H. Lester ... 52
Refractometers. T. M. Lowry ... 384
Repetition-theodolite, Errors in. O. Israel ... 759
Residual Charges, Measurement of. A. Anderson and T. Keane ... 240
Resistance Boxes, Phase Factor of Coils in. W. Hüter ... 866
„ Coils for Alternating-current Work. H. L. Curtis and F. W. Grover ... 502
„ Measurements of High Precision. F. E. Smith ... 506
„ „ in High-frequency Circuits, Accuracy of. S. Loewe ... 1288B
„ of Bubbles in Liquids. P. Vaillant ... 870
„ of Electrolytes. S. W. J. Smith and H. Moss ... 900
„ , Absolute Measurement of by Alternating-current Methods. A. Campbell ... 500
„ , High-frequency, Determination of. L. Högelsberger ... 1045
Resistances, High, Measurement of. Tournier ... 672
„ , Precision, for High-frequency Currents. K. W. Wagner and A. Wertheimer ... 1345
Resonance with Longest Thermal Waves. R. W. Wood ... 1003
Seismograph at Rome, Indications of. G. Agamennone ... 769
Separation of Luminous and Heating Effects of Source of Light. Dussaud ... 1135
"Sharpness" of Real Image produced by Dioptrical Instruments. U. Bordoni ... 1414
Shock Tests, Application of Kinematography in. W. Höniger ... 25
Specific Heats of Liquids: Improved Method. T. W. Richards and A. W. Rowe ... 1843
Spectra, Band, Use of Interferometer for Study of. R. W. Wood ... 1662
Spectral Lines, Measurement of Intensity Distribution in. P. P. Koch ... 1950

7.16
1913

Abstract Nos.

Measurements and Use of Instruments, *continued.*

Spectrograms, Measurement of, with Cylindrical Lens. J. B. Hubrecht ... 583
Spectrum Colours, Demonstration of. M. Siegbahn ... 1273
Speed of Light, Method for Measuring. C. Féry ... 57
Stress Distribution, Determination Optically of. E. G. Coker ... 320
Stresses in Structures, Predetermination of. Mesnager ... 322
Stroboscopic Effects obtained with Incandescent Filaments. C. F. Lorenz ... 670
Sublimates, Method of obtaining. A. L. Fletcher ... 828
Surveying, Stereophotographic. O. Lemberger ... 744
Temperature, Measurement of, by Electrical Means. C. B. Thwing 628
Thermo-couple Arrangement, Calibration of. S. Loewe ... 1052
Thermometers, Exposure of, for Determination of Air Temperature 1255
„ , Magnification of Capillary Thread of. W. Meissner 438
Thermometric Lag. D. R. Harper ... 629
Thomson Bridge, and Four-terminal Conductor. F. Wenner ... 507
Time Transmission, Optical Coincidences for. Schwartz and Villatte 1571
Torsion Balance, Flexure Correction for. V. Crémieu ... 1377
Units, Fixation of, by Legislative Means. R. de Baillehache ... 546
Valves, Aluminium, at High Frequencies. J. Zenneck ... 1721
„ , Electric, Alternate-current Circuits with. N. Papalexi ... 688
Vapour Densities at High Temperatures, Method of determining. G. E. Gibson ... 1069
Variograph Records; Application to Theory of Thunderstorms. W. Schmidt ... 569
Velocities, Gas, Measurement of. W. Altberg ... 753
Velocity, Fluid, New Method of Measuring. Z. Carrière ... 1391
Vibrations of Forks, Mechanical Maintenance of. H. Magunna ... 1313
Viscosity of Air. L. Gilchrist ... 914
„ „ , Simple Method for determining. G. F. C. Searle ... 1115
Visibility of Foreign Substances on Surface of Pure Water. H. Labrouste ... 1388
Voltameter, Silver. E. B. Rosa, G. W. Vinal, and A. S. McDaniel 501, 675
„ , „ . A. Boltzmann ... 503
„ , „ . G. D. Buckner and G. A. Hulett ... 1200
Wave-length Differences, Measurement of. P. P. Koch ... 1268
„ Standards. C. Fabry and H. Buisson ... 1952

Metallography and Properties of Metals.

Ae_1, Equilibrium Temperature for A_1 in Carbon Steel. H. M. Howe 1544
Ae_3 in Carbon-Iron Alloys, Determination of Position of. H. M. Howe and A. G. Levy ... 1543
„ , Discussion of Existing Data as to Position of. H. M. Howe ... 1545
A_3 and A_2, Critical Ranges, of Pure Iron. G. K. Burgess and J. J. Crowe ... 1540
A_2 Inversion, Critical Ranges of Pure Iron with Reference to. H. C. H. Carpenter ... 1541
Alloys, Chemical Method for Study of. A. Portevin ... 526
„ , Metallography of. W. Campbell ... 534
„ , Properties of: Influence of High Temperatures. J. M. Bregowsky and L. W. Spring ... 1084
„ , *see also* separate section.
Aluminium and Tin, Special Bronzes of. F. Robin ... 885
„ and Zinc, Alloys of. W. Rosenhain and S. L. Archbutt ... 276
„ -Copper-Zinc Series, Liquidus Curves of. H. C. H. Carpenter and C. A. Edwards ... 1214
„ -Silver Alloys, Hardness of. G. Le Grix and W. Broniewski 1895
„ , Alloying of. C. H. Ivinson ... 1529
„ , Alloys of, with Vanadium. N. Czako ... 1081
„ , Density of. F. J. Brislee ... 1769
„ , Pure, Increase in Conductivity of. H. Gewecke ... 1139B
Annealing of Worked Products, Experiments on. L. Guillet ... 1551

Abstract Nos.

Metallography and Properties of Metals, *continued.*
Barium, Preparation of. C. Matignon 1209
Beryllium (Glucinum), Metallic. F. Fichter and K. Jablczynski...... 1355
β-Gold and Crystalline Gold, Reactions of. M. Hanriot and F. Raoult 706
Brasses, Aluminium. L. Guillet 1215
„ , Nickel. L. Guillet 1894
Brittleness Test, Notes on. M. Derihon........ 750
Calcium and Calcium Alloys, Preparation of. W. Moldenhauer and J. Andersen........ 1756
Carbon-Iron Equilibrium Diagram, Ruff's. H. M. Howe 529
Case-carbonising. M. T. Lothrop 286
Casting in Ingot Moulds, Coefficient of Flow during. A. Portevin... 1904
Cast Iron and Malleable Cast Iron. W. H. Hatfield 1901
„ „ , Influence of Metalloids on Properties of. H. I. Coe 1547
„ „ , Notes on. A. Sauveur 1083
„ „ , Structure of: Effects of Steam. W. Campbell and J. Glassford........ 723
Cementite, Pro-eutectoid, Biography of. H. M. Howe and A. G. Levy........ 726
Cobalt, Alloys of, with Chromium, etc. E. Haynes........ 720
Coins, Hardness of. T. K. Rose 324
Cold-worked Metals, Crystallisation of, effected by Annealing. F. Robin 134
Copper—Cuprous Oxide, Melting-points of System. R. E. Slade and F. D. Farrow 739
„ -slags, Constitution and Melting-points of. C. H. Fulton ... 307
„ -Tin Alloy, Effect of Casting Temperature upon. E. Heyn and O. Bauer 1897
„ -Zinc Alloys, Influence of other Metals on β Constituent of. H. C. H. Carpenter 1216
„ -Zinc Alloys, Tensile Strength of. J. M. Lohr 884
„ „ -Nickel Alloys. L. Guillet 528
„ , Action of Sulphur Dioxide on, at High Temperatures. C. M. Stubbs 1896
„ , Refined, Metallography of. E. S. Bardwell 1532
„ , Resilience of, as Function of Temperature. L. Guillet and V. Bernard 1531
Corrodibility of Iron, Influence of Various Elements on. C. F. Burgess and J. Aston 1228
Corrosion, Iron, Prevention of, by Counter E.M.F. J. K. Clement and L. V. Walker 1226
„ of Iron by Sulphuric Acid in Presence of other Substances. O. P. Watts........ 1227
„ of Iron, Electrolytic Theory of. B. Lambert 1909
Cylinders, Thick, Resistance of, to Rupture. Malaval 746
Dendritic Structures, Studies of: Application to Metallography. R. Arpi 754
Drawing, Influence of, on Metallurgical Products. L. Guillet........ 1574
Elastic Limit of Alloys. A. Portevin 1113
Endurance Tests, Static and Dynamic. J. O. Roos af Hjelmsäter ... 747
Fatigue Strength, Relation of Static Strength to, under Fluctuations of Load. P. Ludwik 542
„ , Thermoelectric Indication of, as Method of Testing. T. R. Lawson and J. A. Capp 907
Grain Joints and Division of Grains of Metals under Influence of Heat. F. Robin 48
Grains, Growth of, in Metals by Annealing after Cold Working. F. Robin 1546
„ , Large, Generation of, in Metals. F. Robin........ 285
Hardening Tests. G. Charpy 1112
„ , Mechanical, without Deformation. Hanriot 151, 323

7.16
1913

Abstract Nos.

Metallography and Properties of Metals, *continued.*
Hardness. Hanriot 150
Hysteresis, Elastic, of Steel. B. Hopkinson and G. T. Williams 326
Ingots, Pre-rolled Pipeless. B. Talbot 280
„ , Sound, Method of Producing. R. Hadfield 277
„ , „ Steel, Commercial Production of. E. Gathmann 1358
„ , „ „ , Use of Thermit for obtaining. H. Goldschmidt 279
„ , „ , New Method of revealing Segregation in. R. Hadfield 278
„ , Steel, Use of Thermit in Casting. E. A. Beck 1357
Iron and Steel, Microstructure of. W. Campbell 535
„ -Carbon and Iron-Silicon Alloys. E. Gumlich and P. Goerens 282
„ „ Diagram, Proposed Modification of. A. Vinogradoff 1899
„ „ „ , Wittorf's. B. Stoughton 889
„ „ System. O. Ruff 533
„ „ „ , Inverse Occurrence of Solid Phases in. A. Smits 887
„ -Silicon Alloys: Separation of Graphite. G. Charpy and A. Cornu 1549
„ -Silicon Alloys, Transformations of. E. Vigoroux 1363
„ „ „ , „ . G. Charpy and A. Cornu 1362
„ , Charcoal, Effect of High Carbon on. J. E. Johnson, Jr. 1082
„ , Critical Points of. W. Broniewski 1542
„ , Displacement of Critical Points of, by addition of Silicon. G. Charpy and A. Cornu 1898
„ , Industrial Electrolytic, Properties of. L. Guillet and A. Portevin 1086
„ , Modifications of, below 700° C. F. Robin 724
Load-extension Diagrams taken with Optical Indicator. W. E. Dalby 1378
Manganese and Nickel, Carbides of. O. Ruff and E. Gersten 1360
Muntz Metal, Influence of Impurities on. F. Johnson 881
Nitrogen and Iron. J. H. Andrew 283
Nomenclature of Micro-constituents of Steel and Cast Iron. H. M. Howe and A. Sauveur 728
Nomenclature, Uniform, for Iron and Steel. H. M. Howe and A. Sauveur 727
Notched Tension Bars, Stress Distribution in. E. Preuss 1110
Oxygen, Influence of, on Properties of Metals and Alloys. E. F. Law 275
Plastic Alloys, Deformation of. A. Portevin 882
„ Flow, Law of. C. E. Larard 903
Progress in Metallography, 1909–1911. E. Heyn 888
Resilience 905
Riveted Joints, Nickel-Steel, Tests of 544
„ „ , Stresses in: Tearing at Holes. C. Bach and R. Baumann 10
Ropes, Steel Mine Haulage, Safety of. D. F. Baumann 596B
Rusting of Iron (continued). B. Lambert 732
„ „ and Steel, Rate of. J. Aston and C. F. Burgess 1361
Shock Tensile Testing Apparatus: Error involved in Use. N. Davidenkof 748
„ Tests of Cast Steel. J. H. Hall 1539
„ „ on Notched Bars. C. Fremont 543
„ „ with Notched Bars for High-tension Steels. A. Gessner 749
„ „ , Report on. G. Charpy 541
Slag Enclosures. W. Rosenhain 725
Sodium and Potassium, Stretching and Breaking of. B. B. Baker 1768
Solidification of Metals from Liquid State. G. T. Beilby 152
Solid Solutions, Size of Molecule of Metals in. M. Padoa and F. Bovini 525
Steel, Case-hardened, Hardness and Depth of Carbonisation in. M. A. Ammon 281

Abstract Nos.

Metallography and Properties of Metals, *continued.*

Steel, Crystallisation of. F. Giolitti 1212
  „ , Effect of Holes on Strength of. C. Birault 1140B
  „ , Exothermic. W. O. Amsler 136
  „ , „ . W. W. Clark and P. Kemery 1553
  „ , „ , Correspondence on 722
  „ , Hypereutectoid Tool, Hardening. S. S. Steinberg 1900
  „ , Low-Carbon, Coarse Crystallisation Produced by Annealing. R. H. Sherry 284
  „ , Low Carbon : Influence of Divorce Annealing on. H. M. Howe and A. G. Levy 886
  „ , Macrostructure and Crystallisation of. N. T. Belaiew 135
  „ , Mild : Influence of Arsenic. J. Liedgens 1087
  „ , „ ; Transition from Elastic to Plastic State in. A. Robertson and G. Cook 1770
  „ , Over-oxidation of. W. R. Shimer and F. O. Kichline 1903
  „ , Quenching, Volume-changes in. M. Oknoff 1902
  „ , Structure of. S. V. Biélynsky 2012
  „ , Studies in Cold Flow of. P. Longmuir 1548
Steels, Certain, Divergences between Structure and Composition of. Brès 1552
  „ , Nickel-Chrome, Points of Transformation of. L. Guillet 1550
  „ , Standard, Thermal Examination of. G. K. Burgess, J. J. Crowe, and H. S. Rawdon 1538
Strengths of Thermally-treated Metals and Alloys. W. Müller 883
Stretching of Metals. Hanriot 325
Struts, Tensile Yield-point and Collapsing Load of. O. Greger 751
  „ , Three, from Collapsed Gasholder, Tests of. H. Rudeloff 1111
Sublimation of Metals at Low Pressures. G. W. C. Kaye and D. Ewen 1847
Tensile Tests of Metals : Effect of Temperature. A. K. Huntington 153
Testing with Freely Falling Ball. J. J. Schneider 154
Tin, System. A. Smits and H. L. de Leeuw 721
Titanium and its Cleansing Effect on Cast Iron. B. Stoughton 530
Triferrocarbide (Cementite). O. Ruff and E. Gersten 1359
Tungsten, Ductile. C. G. Fink 1141B
Vacuum-furnace Metallurgy. C. G. Fink 1213
Welded Joints in Iron and Steel, Experiments on. T. E. Stanton and J. R. Pannell 6
Why does Lag Increase with Temperature from which Cooling Starts? H. M. Howe 1088
Zinc, Polymorphism of. P. N. Laschtschenko 1530

Meteorology.

Absorption of Light in Atmosphere. G. Müller 772
  „ , Atmospheric, and Polarisation of Light diffused by Sky. A. Boutaric 1123
Aqueous Vapour above Mount Wilson, Determination of. F. E. Fowle 1931
Atmospheric Circulation in Temperate Latitudes, Variations in. A. Defant 557
Atmospheric Cooling and its Measurement. J. R. Milne 359
  „ Pressure, Diurnal Variations of. W. J. Humphreys ... 566
  „ Radiation, Note on. F. W. Very 932
  „ Studies. J. W. Sandström 568
Balloon Ascents, Unmanned, in North Polar Regions. H. Maurice 774
Barometric Pressure, Antarctic. G. C. Simpson 926
Cirrus Clouds, Motion of, in Relation to Movement of Barometric Minima. T. Hesselberg 1785
Climate of British Columbia 165
Clouds, Observation of Motion of, with Nephoscope. A. Lo Surdo... 570
Correlation : Application to Variations of Pressure. W. Köppen ... 925
Dust, Origin of Falls of, in Ocean. G. Hellmann 933

V.16
1913

7.16
.913

Abstract Nos.

Meteorology, *continued.*
Earth's Non-adiabatic Atmosphere, Thermodynamics of. F. H. Bigelow 931
Evaporation from Soil and Plants. A. Müntz 30
„ on the Nile near Khartum. R. Türstig 567
Föhn, Investigations of. H. v. Ficker 559
„ , Temperature and Humidity on Occasions of. H. v. Ficker 560
Forecast, Long-range, for East Monsoon in Java. C. Braak 1253
Frost Protection, Suggestions for. K. F. Kellerman 564
Haze, Dense, of June 10–11, 1912. H. H. Kimball 162
Haziness, Unusual Atmospheric, during 1912. H. H. Kimball 1254
Humidity, Atmospheric, as related to Haze, Fog, and Visibility. A. H. Palmer 1587
Hurricanes of West Indies. O. L. Fassig 1121
Ice Storms, Three. C. F. Brooks 1584
Isothermal Layer, and Sky Radiation. F. W. Very 930
Nocturnal Radiation to Space, Studies of. A. Ångström 1933
Nuclei, Condensation, in Atmosphere. A. Wigand 773
Penetrating Atmospheric Radiation, Distribution in Height of. E. Schrödinger 1789
Pilot Balloon Ascents at Vienna, Results of. R. Dietzius 1788
Polarisation, Atmospheric, Neutral Points of. C. Dorno 771
Precipitation, Solid, Origin of. G. Hellmann 357
Pressure and Temperature, Simultaneous Interdiurnal Changes of, on Sonnblick. J. v. Hann 1784
„ , Geographical Distribution of Monthly Variations of. W. Köppen 562
„ -variations, Influence of, on Weather in Austria. O. v. Myrbach-Rheinfeld 770
Pyrheliometers, Comparison Measures with. W. Marten 360
Radiation Equation $K_{10} = cT^{a}_{10}$ in Earth's Atmosphere. F. H. Bigelow 929
Rainfall and Atmospheric Pressure in East Indian Archipelago. C. Braak 356
„ Measured along the Panama Canal 928
„ over Balkan Peninsula. F. Trzebitzky 768
„ „ Long Periods. A. E. Douglass 927
Solar Radiation Intensities at Madison. H. H. Kimball and E. R. Miller 164
„ Radiation, Atmospheric Disturbances and. C. Dorno 565
„ „ , Diminution of, during 1912. D. Eginitis 1594
„ „ , „ „ „ . L. Gorczyński 1791
„ „ , „ , in 1912. A. Schedler 1790
„ „ : Influence of Clouds. H. H. Kimball and E. R. Miller 163
„ Radiation, Measurements of. C. G. Abbot 1598
„ „ , Variation of. C. G. Abbot, F. E. Fowle, and L. B. Aldrich 1606
Squalls, Line-, among Mountains, Studies on. A. Roschkott 1786
„ , „ , Occurrence of, in relation to March of Barometer. Durand-Gréville 1122
Temperature and Pressure in Baroma, Observations of. J. Fényi 1787
„ Observations of Soil covered with different Materials. P. Vujević 358
„ -distribution on Occasions of Föhn. F. Pockels 1783
„ , Difference of, between Free Air and Air on Mountains. H. v. Ficker 1932
„ , Diurnal Variation of, at Tor on the Red Sea 563
Thermometers, Exposure of, for Determination of Air Temperature 1255
Thunderstorms, Variograph Records and their Application in Theory of. W. Schmidt 569
Wind Force, Diurnal Variation of, at Summit of Ben Nevis. J. v. Hann 561
Winds, High Tropical. W. van Bemmelen 558

For the Explanation of this Index see p. 697.

Abstract Nos.

Miscellaneous (Chemical Physics and Electro-Chemistry).
Absorption, *see* separate section.
Allotropy and Enantiotropy, Theory of, for Liquids. A. Smits 309
"a" of van der Waals' Equation, determining, from Surface Tension. A. P. Mathews 1096
Alloys, *see* separate section.
Association Phenomena in Gaseous Mixtures. A. Schulze 1556
„ , Molecular, in Gases. J. de Boissoudy 290
„ , Mutual, of Ether and Chloroform. F. Dolezalek and A. Schulze 293
Atomic Weights, *see* section Molecular Physics.
Barium, Preparation of. C. Matignon 1209
Beryllium (Glucinum), Metallic. F. Fichter and K. Jablczynski...... 1355
Brownian Movements, *see* section Molecular Physics.
Carnallite, Fused, Properties of. K. Arndt and H. H. Kunze 734
Chemical Action, Influence of Geometrical Shape on. G. Reboul ... 729
„ „ produced by α-Particles, Nature of. S. C. Lind ... 271
„ Actions, Molecular Statistics of. R. J. Strutt 270
„ Effects of Explosion of Azoimide. P. J. Kirkby and J. E. Marsh 1103
"Chemical News," 1860–1909, Hundred-volume Index to 1234
Chemical Reactions and Radii of Curvature. G. Reboul 1356
„ „ at very Low Pressures. I. Langmuir......... 891, 1890
Colloid Synthesis, Electrical, Nature of. C. Benedicks 532
Condensation of Water-vapour in Presence of Nitrogen Oxides. W. Bieber 1101
Conductivity-water, Preparation of. R. Bourdillon........ 1559
„ , *see* section Conductivity and Resistivity.
Crystal Space Lattices. A. E. H. Tutton, W. H. Bragg........ 266
Crystals (except Liquid and Mixed Crystals), *see* section Molecular Physics.
Decomposition of Water by α-Rays. W. Duane and O. Scheuer...... 1077
Diffusion, *see* separate section.
Dissociation and Ionisation, *see* separate section.
Electric Furnace Processes, *see* separate section.
Electrodes, Normal, *see* section Batteries, Primary.
Electrolysis, *see* separate section.
Electrolytic Analysis, *see* separate section.
Endothermic Compounds, Formation of, at high Temperatures. E. Briner........ 274
Equilibrium, Chemical, *see* section Chemical Equilibrium.
Free Energy of Chemical Substances. G. N. Lewis 1561
Gases, Chemical Constants of. O. Sackur 880
„ ; for Gaseous Laws *see* separate section.
Hydrogen, Chemically Active Modification of. I. Langmuir 523
„ from Water and Coal from Cellulose. F. Bergius 1366
Ionisation, *see* section Dissociation.
Law, New, relating to Heats of Formation of Solid, Liquid, and Ionic Molecules. W. R. Bousfield 1220
Liquid-crystals: Influence of Vortex Motion on Structure. O. Lehmann........ 132
„ -crystals, Orientation of, by Plates of Mica. C. Mauguin...... 1369
„ „ , Structure of. O. Lehmann 132
„ Mixtures, Knowledge of. I. R. B. Denison 313
Molecular Attraction, *see* section Molecular Physics.
„ Weight and Turbulence Viscosity. W. Sorkau........ 1090
Neon and Helium, Classification and Transformations of. H. Wilde 1523
„ , Occurrence of, in Vacuum Tubes containing Hydrogen. I. Masson........ 1329
„ , Presence of, in Hydrogen after Passage of Discharge. J. N. Collie and H. S. Patterson 1330

For the **Explanation** of this Index see p. 697.

V.16
1913

7.16
1913

Abstract Nos

Miscellaneous (Chemical Physics and Electro-Chemistry), *continued.*
Neon, Supposed Synthesis of. W. Ramsay, J. N. Collie, H. S. Patterson, J. J. Thomson ... 879
Nitrogen, Active. F. Comte ... 707
„ , Chemically Active. A. Koenig and E. Elöd ... 1072
„ , „ „ . R. J. Strutt ... 1073, 1745
„ , Fixation of, by Barium Oxide and Charcoal. T. Ewan and T. Napier ... 1365
„ , Oxidisable Variety of. T. M. Lowry ... 1887
Nuclei, Formation of, in Gases, by Ultra-violet Light. F. Bortini ... 1031
Oil Emulsion, Neutral, as Model of Suspension Colloid. R. Ellis ... 1906
Optical Activity and Rotation, *see* section Polarisation.
Osmosis, *see* separate section.
Oxidation and Combination of Gases by Electric Discharge, *see also* section Discharge.
Phase Rule, *see* sections Chemical Equilibrium and Thermodynamics.
Periodic Law, Radio-elements and. F. Soddy ... 1075
„ System, and Radio-active elements. K. Fajans ... 1079
„ „ , „ -elements. A. S. Russell ... 1074
Phosphorus. A. Smits, J. W. Terwen, and H. L. de Leeuw ... 1525
Photochemical Deozonisation. E. Warburg ... 1557
„ Reaction, Determination of Luminous Energy Absorbed in. A. Tian ... 1647
„ Reaction, Energy Absorbed in. V. Henri and R. Wurmser ... 1011
„ Reaction, Energy Absorbed in. M. Boll ... 1219
Problems, Chemical, Further Applications of Positive Rays to Study of. J. J. Thomson ... 1210
Quartz, Attack of, by Vapours of Hydrofluoric Acid. A. Gautier and P. Clausmann ... 1528
Radio-active Disintegration Products, Chemical Nature of. A. Fleck 1080
„ -chemistry: Application of Principle of Relativity. R. Swinne 1076
„ -elements, Connection between Chemical Characteristics of, and Transformations. G. v. Hevesy ... 131
Radium Radiations, Influence of, on Glass and Minerals. S. Meyer and K. Przibram ... 524
„ Rays. III. Action on Inorganic Compounds. A. Kailan... 715
„ „ . IV. Action on Organic Compounds. A. Kailan ... 716
„ Rays, Chemical Action of. V. Cane Sugar. A. Kailan... 1741
Refraction, Molecular. G. Pólya ... 1367
Solid State, Theory of. E. Grüneisen ... 268
Solids: Effect of High Pressures on Chemical Behaviour. J. Johnston and L. H. Adams ... 1211
Solution and Solubility, *see* separate section.
Sulphur, New Modification of. A. H. W. Aten ... 272
Sunlight. P. C. Freer and H. D. Gibbs ... 717
Thermochemistry, *see also* section Miscellaneous (Heat).
Thermodynamic Investigations, *see* section Thermodynamics.
Thorium, Chemical Properties of. H. N. McCoy and C. H. Viol ... 1217
Tungsten Lamp, Chemical Clean-up of Nitrogen in. I. Langmuir... 1890
Ultra-violet Light, Action of, on *o*-, *m*-, and *p*-Nitrobenzaldehyde. A. Kailan ... 714
„ Light, Action of, on Water. W. Obolensky ... 713
Uranium, Diffusion of. G. v. Hevesy and L. v. Putnoky ... 718
Vapours; for Gaseous Laws, *see* section Gases.
Viscosity, *see* separate section, *also* section Solution.
Volume, Specific, of Binary Mixtures, Abnormal Cases of. H. S. Van Klooster ... 1222

Miscellaneous (Electricity and Magnetism).
Alternate-Current Research, *see* separate section.
Arc, Electric, *see* section Discharge.

Abstract Nos.

Miscellaneous (Electricity and Magnetism), *continued.*
Atmospheric Electricity, *see* section Static Electricity.
Attraction between Coaxial Solenoids carrying Electric Current. G. R. Olshausen 1506
Capacity (Electrostatic), *see* separate section.
Cells, Voltaic, *see* section Batteries, Primary.
Condensers, *see also* sections Dielectrics and Discharge.
Conductivity (Electric) and Resistivity, *see* separate section.
Constriction Experiment, Electric. E. F. Northrup 677
Contact Electricity, *see* section Batteries, Primary.
Crookes Tubes, *see* section Discharge.
Current Induction in Vibrating Cylinders. J. Kern 2004
Dielectrics, *see* separate section.
Discharge (Electric), *see* separate section.
„ Rays, *see* section Rays.
Disintegration, Electrical, of Metals: Use as Method of Testing. C. Benedicks.. 679
Earth Currents, *see* section Terrestrial Magnetism and Electricity.
Electrical Effects of Explosion of Azoimide. P. J. Kirkby and J. E. Marsh 1103
Electrification, *see* section Static Electricity.
Electrocapillarity, Theory of. D. L. Chapman 1505
Electrocapillary Curve, Ideal, Shape of. F. Krüger and H. Krumreich 1875
„ Pulsation of Mercury Meniscus. A. P. Roshdestwensky and W. C. McC. Lewis 248
Electromagnetic Theory, *see* separate section.
E.M.F. produced by Flow of Electrolyte through Capillary Tubes. L. Riéty 1344
„ produced in Solutions by Centrifugal Action. W. L. Miller 1368
Electron Atmospheres of Metals, Preliminary Note on. R. W. Wood 865
Electrostatics, *see* section Static Electricity.
Field, Magnetic, *see* section Magnetism.
Four-terminal Conductor and Thomson Bridge. F. Wenner 507
Galvanometers, *see* sections Apparatus and Measurements.
Hall-effect, *see* section Magnetism.
Hysteresis, *see* section Magnetism.
Induction, Magnetic, *see* section Magnetism.
„ (Self and Mutual) *see* separate section.
Interrupters, *see also* section Apparatus (Electrical).
Kathode Rays, *see* section Rays.
Light-radiation and Telephone. O. Grotrian 1198
„ , Effect of, on Telephone. O. Grotrian 676
Lightning, *see* section Static and Atmospheric Electricity.
Magnetism, *see* separate section.
Measurements, *see* separate section.
Ohm, Ampere, and Volt. Memory of Fifty Years, 1862–1912. R. T. Glazebrook.................... 1458
Parallel Conductors, Electric and Magnetic Fields of System of. O. Colard 120
Permeability, *see* section Magnetism.
Phenomenon, Electrical. A. A. Campbell Swinton.................... 2005
Photo-electric Cells, *see* section Batteries, Primary.
Piezo- and Pyro-electricity; Kinetics of Dielectrics. E. Schrödinger 1457
„ „ -electric Properties of Quartz. H. K. Onnes and A. Beckman 1494
Polarisation (Electrolytic), *see* separate section.
Potential and Electromotive Force. W. Lenz.................... 871
Reaction of Copper Disc rotating between Poles of Magnet. W. G. Cady and F. G. Benedict 254
Resistance between Metal and Crystal at Surfaces of Separation. F. Streintz 119

V.16
1913

Abstract Nos.

Miscellaneous (Electricity and Magnetism), *continued*.
Resistance between Plates in Contact. F. Streintz and A. Wesely... 1491
Röntgen Rays, *see* section Rays.
Screening, Electric, by Silver Films. [Miss] S. Hyatt 214
Selenium, Action of. A. Pochettino 233
„ , Effect of Abrasion on Conductivity of. F. C. Brown 232
„ , Variation of Resistance of, due to X- and Radium-rays. H. Guilleminot 1197
Specific Inductive Capacity, *see* section Dielectrics.
Static Electricity, *see* separate section.
Telegraphy, *see* Section B.
Telephony, *see* Section B.
Terrestrial Magnetism and Electricity, *see* separate section.
Thermo-electricity and Magnetism, *see* separate section.
Tubes, Vacuum, *see* sections Discharge and Apparatus.
Voltaic Action, *see* section Batteries, Primary.
Waves, *see* section Oscillations and Waves.
Wireless Telegraphy, *see* Section B, *also* section Oscillations.
X-Rays, *see* section Rays.

Miscellaneous (General Physics).
Aerodynamics, *see* section Dynamics.
Alloys, *see* separate section.
Astronomy, *see* separate section.
Atomic Weights, *see* section Molecular Physics, Matter and Ether.
Brownian Motions, *see* section Molecular Physics.
Capillarity, *see* section Surface Tension.
Continuity. O. Lodge 1580
Critical Constants, *see* section Critical Points.
Deformation, *see* section Elasticity.
Diffusion, *see* separate section.
Dynamics, *see* separate section.
Elasticity, *see* separate section.
Ether, *see* section Molecular Physics, Matter and Ether.
Expansion, *see* section Dilatation.
Explosive Wave, Propagation of, in Solids. J. Taffanel and H. Dautriche 160
Fourier's Theorem, Application of, to Physical Problems. Rayleigh 339
Function, Arbitrary, Spectroscopic Resolution of. C. V. Burton...... 1780
Geographical Position of Mecca and Jidda. N. Scheltema 336
Gravity, *see* separate section.
Harmonic Analysis, Graphical, Chart for. H. Rottenburg 490B
„ „ , New Method of. F. Meurer 360B
Ice Friction under Pressure. H. Morphy... 545
„ , Properties and Structure of. R. S. Tarr and J. L. Rich............ 1243
Measurements, *see* separate section.
Mechanical Problems, *see* section Dynamics.
Metallography, *see* separate section.
Meteorology, etc., *see* separate section.
Reichsanstalt, Work of, in 1911 348
„ , „ , in 1912 1238
Rigidity, *see* section Elasticity.
Sand Dunes, Formation of. P. Hahmann.. 17
Screw Propeller Design. C. W. Dyson 556
Solids, Effect of High Pressures on Behaviour of. J. Johnston and L. H. Adams 1211
Steam, Efflux, Velocity and Specific Heat of, *see* sections Gases and Specific Heat, *also* Section B.
Stress, *see* sections Elasticity and Metallography.
Surface Tension, *see* separate section.
Thermal Effect accompanying Immersion of Powder in Liquid. H. Gaudechon 1749
Time Conference, International. J. Reyval 3

For the **Explanation** of this Index see p. 697.

.16
913

Abstract Nos.

Miscellaneous (General Physics), *continued.*
- Torsion, *see* section Elasticity.
- Units and Symbols, A.E.F. Recommendations for 908
- „ , Fixation of, by Legislative Means. R. de Baillehache 546
- Unsinkability of Modern Sea-going Ships. Flamm 551
- Viscosity, *see* separate section.

Miscellaneous (Heat).
- Boiling-Points, *see* section Freezing-Points.
- Combustion of Carbon, Mode of. T. F. E. Rhead and R. V. Wheeler 1006
  - „ of Gaseous Mixtures and Retardation on Ignition. Taffanel and Le Floch 1448
  - „ , Surface. J. R. Thompson.. 631
  - „ , Whirling Gaseous, New Forms of. J. Meunier 457
- Conductivity (Thermal), *see* separate section.
- Convection and Radiation of Heat. I. Langmuir 1974
- Dilatation, *see* separate section.
- Emissivity of Oxidised Metallic Surfaces. C. P. Randolph and M. J. Overholser 1969
  - „ of Solid and Liquid Copper at High Temperature. C. M. Stubbs 1005
- Expansion, *see* section Dilatation.
- Explosions in Mixed Gases: Limits of Inflammability. E. Jouguet 1172
  - „ , *see also* section Gases.
- Freezing-, Melting-, and Boiling-Points, *see* separate section.
- Gases and Vapours, *see* separate section.
- Heating and Cooling Palladium in Hydrogen: Thermal Effects. J. H. Andrew and A. Kolt 1970
- Heat of Vaporisation of Metals. A. Wehnelt and C. Musceleanu...... 456
- Ice, Melting of. E. E. Somermeier... 95
- Icebergs, Melting, Rise of Temperature near. H. T. Barnes 194
- Ignition of Electrolytic Gas by Electric Discharge. H. F. Coward, C. Cooper, and C. H. Warburton 458
- Latent Heat, *see* section Specific Heat.
- Measurements, *see* separate section.
- Melting-Points, *see* section Freezing-Points.
- Photochemical Reactions, *see* section Miscellaneous (Chemical Physics).
- Pyrometry, *see* section Thermometry.
- Specific Heat, *see* separate section.
- Spectral Radiation of Heated Enclosure, Constants of. W. W. Coblentz 1004
- Spheroidal State. C. W. Batdorf.. 94
- Sublimation of Metals at Low Pressures. G. W. C. Kaye and D. Ewen 1847
- Temperature, *see* separate section.
- Temperatures (High and Low), *see* separate section.
- Thermal Effect accompanying Immersion of Powder in Liquid. H. Gaudechon 1749
- Thermodynamic Properties of Twelve Liquids between 20° and 80° and up to 12,000 kg./cm². P. W. Bridgman 1304
- Thermodynamics, *see* separate section.
- Trouton Quotient and Heat of Vaporisation. Data for Helium. de Forcrand 1450
  - „ Quotient and Molecular Heat of Evaporation. de Forcrand 1449
- Vapour Pressure, *see* separate section.

Miscellaneous (Light).
- Absorption, *see* separate section.
- Balloon Shadows during Solar Eclipse. A. Wigand and E. Everling 41
- Chemical Production of Light. W. D. Bancroft............................ 810
- Colour, Measurement of. A. C. Jolley and A. J. Bull 582
- Crookes Tubes, *see* Tubes (section Discharge).

V.1
191

Abstract Nos.

Miscellaneous (Light), *continued*.
  Diffraction, *see* section Interference.
  Dispersion, *see* separate section.
  Electromagnetic Waves. *see* section Oscillations and Waves.
  Fermat's Law. D. N. Mallik 1811
  Fluorescence, *see* section Phosphorescence.
  Glass, Optical, Limits of Uniformity in producing. J. W. Gifford 51
  Gold Hydrosols, Centrifugalised, Optical Behaviour of. H. Robitschek 398
  Graphic Method of Optical Imagery. W. R. Bower........ 1143
  Image Errors of Optical Systems. E. Waetzmann........ 395
  Images, General Theory of. M. Wolfke 176
  Index of Reflection, *see* section Reflection.
  „ of Refraction, *see* section Refraction.
  Interference, *see* separate section.
  Kathode Rays, *see* section Rays.
  Lenses, Compound, Central Abberation in. H. Violette 590
  Liquid-crystals, Orientation of, by Plates of Mica. C. Mauguin...... 1369
  Measurements, *see* separate section.
  Mirage, Double. W. Hillers........ 1943
  Mirror, Moving, Theory of. A. Harnack 402
  Mirrors, Silver, Preservation of. L. Bell 1650
  Monochromators of Great Light Intensity, Theory of. G. J. Elias........ 587
  Objectives, Fluorite ; Modern Microscopical Optics. C. Metz 586
  „ , Spectrograph, Design of. K. Schwarzschild 401
  „ , Spherical Aberrations in. L. Dunover 1651
  Optical Constants of Certain Metals in Infra-red. K. Fösterling and V. Freedericksz........ 796
  „ Constants of Metals. C. Zakrzewski 170
  „ „ „ . J. T. Littleton, Jr........ 175
  Optics, Geometrical, Trend of. S. P. Thompson 1271
  Passage of Waves through Fine Slits in Thin Screens. Rayleigh ... 1942
  Photography, *see* separate section.
  Photometry, *see* separate section.
  Pictures True to Nature : Conditions necessary. A. Gleichen 1649
  Polarisation, *see* separate section.
  Pressure of Light by Use of Thin Foil. G. D. West 1945
  Projection of Natural Colours. A. Guébhard 799
  Propagation of Light in Non-homogeneous Media. K. Försterling 1134
  „ , Light, in Layered Media. A. Garbasso........ 391
  Rainbows. W. Möbius 1140
  Rays, *see* separate section.
  Reflection, *see* separate section.
  Reflector, Cassegrain, with Corrected Field. R. A. Sampson 1639
  Refraction, *see* separate section.
  Resonance, Optical, Remarkable Case of. L. Dunoyer........ 972
  Röntgen Rays, *see* section Rays.
  Rotatory Polarisation, *see* section Polarisation.
  Scattering of Light. J. R. Milne 1944
  Solidified Gases, Optical Investigation of. W. Wahl 133, 1071, 1740
  Speed of Light, Method for Measuring. C. Féry 57
  Theories, Emission, of Light. R. C. Tolman 56
  Torque by Beam of Light in Oblique Refraction through Glass. G. Barlow 967
  Transparency, *see* section Absorption.
  Velocity of Light, Constancy of. W. de Sitter 1418
  „ „ , Effect of Reflection from moving Mirror on. A. A. Michelson 1265
  Water, Optical Properties of. C. Chéneveau 1419
  X-rays, *see* section Rays.

For the **Explanation** of this Index see p. 697.

.16
913

Abstract Nos.

Molecular Physics, Matter and Ether.
Air-pump, Molecular. W. Gaede 1763
"a" of van der Waals' Equation, Method of determining, from Surface Tension. A. P. Mathews 1096
Atom, Radiating, Model of. K. F. Herzfeld 205
„ , "Rutherford." G. S. Fulcher 1579
„ , Structure of. J. J. Thomson 762
„ , Viscosity of. L. Décombe 1393
Atoms and Molecules, Constitution of. N. Bohr 1930
„ , Multiply-charged. J. J. Thomson 206
Atomic Forces, Electrical and Chemical, Theory of. A. Byk 1891
„ Weight of Helium, Density and. W. Heuse 1886
„ Weights of Elements, New Multiple Relations of. H. Wilde 1523
Brownian Motions and Probability Law. R. v. Ettenreich 338
„ „ in Gases at Low Pressures. R. A. Millikan 840
„ Movement and Size of Molecules. J. Perrin 27
„ Movements of Particles not Spherical. K. Przibram 1249
Collisions, Exceptional, of Gas Molecules. P. Langevin and J. J. Rey 1247
Colloid Synthesis, Electrical, Nature of. C. Benedicks 532
Crystal Form, Dependence of, on Temperature. G. Tammann 141
„ Space Lattices. A. E. H. Tutton, W. H. Bragg 266
Crystalline Properties of Chlorine and Bromine. W. Wahl 1740
Crystallised Nitrogen, Argon, and Methane, Investigation of. W. Wahl 133
Crystallographic Properties of Hydrogen and Oxygen. W. Wahl ... 1071
Crystallography, Advance in. A. E. H. Tutton 1524
Density of Aluminium. F. J. Brislee 1769
„ of Liquids in Contact. A. L. Clark 171
Diamond, Structure of. W. H. Bragg and W. L. Bragg 1778
Do Molecules attract Inversely as Square of Distance? A. P. Mathews 1747
Electrons, *see* section Electromagnetic Theory.
Element, New, in Atmosphere. F. W. Aston 2010
Ether. D. L. Webster 161
Films, Soaps, Electric Resistance of. A. Hagenbach 1340
Friction, External, of Gases. W. Gaede 1245
Ionic Size in Relation to Molecular Physics. W. R. Bousfield 1220
Kinetic Theory of Gases, *see also* section Gases.
Matter, Foundation of Theory of. G. Mie 18, 340
Molecular Agitation at Absolute Zero. A. Einstein and O. Stern 1016
„ Attraction, Law of. J. E. Mills 306
„ „ , Potential of, Laws of Surface Adsorption and. J. R. Katz 712
„ Cohesion. A. P. Mathews 1748
„ Forces, Investigation of, by Disturbance of Equilibrium in
„ Liquid-crystals. O. Lehmann 1578
„ Phenomena not in agreement with Thermodynamics. M. v. Smoluchowski 633
„ Statistics of some Chemical Actions. R. J. Strutt 270
„ Symmetry. A. Cotton 399
„ Theory. H. A. Lorentz 766
Molecules, Formation of, from Thomson's Atoms. A. C. Crehore ... 1779
Roughness of Free Liquid Surfaces. L. Mandelstam 1392
Specific Gravity, Unusual Case of. A. L. Hyde 269
Spontaneous Variations of Concentration. T. Svedberg 730

Oscillations and Waves (Electric), *see also* sections Rays, Discharge.
Absorption of Electric Waves in Iron. K. F. Lindman 2000
„ , Selective, of Electric Waves. W. Romanoff 860
Anchor-ring, Thin, Electrical Vibrations on. Rayleigh 231
Arc and Spark Sending Apparatus for Radio-telegraphy, Comparison of. L. W. Austin 685B
Bending of Electric Waves round Large Sphere. J. W. Nicholson 490

V.1
191

.16
913

Abstract Nos.

Oscillations and Waves (Electric), *continued.*
- Conductivity of Fused Metallic Salts: Effect of Oscillations. C. Tissot ... 1720
- Coupled Circuits in Wireless Telegraphy, Exact Mechanical Analogy to. T. R. Lyle ... 1194
  - „ Condenser Circuits, Ionised Spark-gap in. P. Kaltenbach 1012B
  - „ „ „, Three, Oscillations in System of. F. Müller ... 863
  - „ Oscillation Circuits, Waves in. E. Dibbern ... 1485
  - „ Oscillatory Circuits, Simple Theory of, with Oscillograms. J. A. Fleming ... 1867
  - „ Oscillatory Circuits, Solution of Equations of. F. Kiebitz 668
- Current-potential Curves of Oscillating Spark. S. R. Milner ... 492
- Detector, Wireless, Bunsen Flame as. G. Leithäuser ... 230
- Diffraction and Secondary Radiation with Short Electric Waves. A. D. Cole ... 861
  - „ of Electric Waves at Parallel Cylinders. F. Záviška ... 1483
- Dispersion, Electric, in Benzol, Toluol, and Petroleum. N. Linnitschenko ... 1717
- Disturbance-preventer, Crystal Contact, for Radio-telegraphic Receiving. L. W. Austin ... 1125B
- Eclipse of Sun, Wireless Telegraphy Measurements during. E. Take and M. Vos ... 101B
- Effect produced by Obstacle on Train of Electric Waves. H. M. Macdonald ... 491
- End Correction to Rods in Electrical Problems. Rayleigh ... 667
- Ferro-magnetism, Disappearance of, under Short Electric Waves. W. Arkadief ... 1732
- Hertzian Oscillations from Kathode. K. Birkeland ... 1041
- Hysteresis of Iron under Electrical Oscillations. H. Fassbender and E. Hupka ... 128
- Impact Excitation of Condenser Circuit. D. Roschansky ... 209B
  - „ „ of Electrical Oscillations, New Method of. M. Vos ... 1200B
  - „ Excitation of Electrical Oscillations, Theory of. H. Warfvinge 291B, 1199B, 1487
- Overtones of Oscillation Circuits. K. W. Wagner ... 210B
- Phenomenon, Electrical. A. A. Campbell Swinton ... 2005
- Poulsen Arc Circuit, Oscillations in. K. Ort ... 114
  - „ „, Oscillations of. K. Fassbender and E. Hupka ... 1193
- Propagation of Electric Waves along Conductors, Effect of Junctions on. Rayleigh ... 1040
  - „ of Electric Waves round Bend of the Earth. W. H. Eccles ... 109
  - „ of Hertz Waves along Metal- and Liquid-surfaces. F. Erb ... 1039
  - „ of "Wireless" Waves around Earth's Surface. W. v. Rybczyński ... 1489
- Quenched Spark, Theory of, in Coupled Circuits. H. Warfvinge ... 291B, 1199B, 1487
- Radio-telegraphy, Radiated and Received Energy in. L. W. Austin ... 1124B
- Reflection of Electric Waves by Ionised Gases. J. Salpeter ... 1192
- Refraction of Electric Waves by Atmosphere. F. Kiebitz ... 1488
- Resistance of Flat Spirals and Short Coils for H.F. Oscillations. R. Lindemann and W. Hüter ... 1195
- Resonance Curves, Demonstration of. F. Kock ... 864
- Resonators for Short Electric Waves. W. S. Nelms and W. L. Severinghaus ... 1719
  - „, Screens of, Reflection of Short Electric Waves from. W. L. Severinghaus and W. S. Nelms ... 1718
- Secondary Electrical Oscillations. K. F. Lindman ... 1482

For the **Explanation** of this Index see p. 697.

Abstract Nos.

Oscillations and Waves (Electric), *continued.*
  Shock Excitation with Different Couplings. H. Rohmann 1127B
  Short Electric Waves, Abnormal Dispersion of. F. Eckert 1337
  " " " , Absorption of, by Air and Water-vapour. J. E. Ives 1336
  Short-wave Electric Transmitters. G. Mie 2001
  " " " , Energy of. G. Leimbach 1486
  Spark in High-frequency Circuit, Energy Dissipation of. H. R. v. Traubenberg 862
  Tuned Secondary Condenser Circuit, Current in. E. Taege 1998
  Velocity of Electric Waves along Wires enclosed in Metal Casing. J. Wallot and K. Schäfer 1484
  Vibrations, Electrical, associated with Thin Rods. H. M. MacDonald 1038
  Wave-length, Optimum, in Radio-telegraphy. A. H. Taylor 794B
  Waves, Electromagnetic, and Mode of their Propagation. G. W. O. Howe 1999
  Wireless Telegraphy, Atmospheric Refraction in. W. H. Eccles ... 1871

Osmosis.
  Osmotic Pressure of Electrolytes: Effect of Interionic Forces. S. R. Milner 1753
  " Pressure, Relation of, to Temperature. W. F. Magie 531

Phosphorescence and Fluorescence.
  Fluorescence Spectrum of Iodine Vapour. J. C. McLennan 1284
  " , Absorption and Dispersion of Light. B. Söderborg... 1420
  " , X-ray. W. Kaufmann 1286
  Fluorescent Substances, Photoelectric Investigation of. W. E. Pauli 1152
  Light, Chemical Production of. W. D. Bancroft 810
  Luminescence of Phosphorus Vapour. H. Schmidt 987
  " , Theory of. E. Pringsheim 988
  " , X-ray, of Mercury Vapour. St. Landau and H. Piwnkiewinz 1287
  Phosphorescence of Alkaline-earth Sulphides; Influence of Temperature. H. E. Ives and M. Luckiesch 428
  Phosphorescence of Mercury-vapour after Removal of Exciting Light. F. S. Phillips 1827
  Phosphorescence, Electron Theory of. C. A. Butman 986
  Phosphorescent Alkaline Earths, Excitation of, by Canal Rays. H. Baerwald 429
  Resonance, Optical, Remarkable Case of. L. Dunoyer 972

Photography.
  Bank-note Printing, Developments in, necessitated by Advances in Photography. A. E. Bawtree 1424
  Blackening Distribution in Wedge Slit Photographs obtained with X-rays. P. P. Koch 1137
  " of Photographic Dry Plates, Law of. E. Kron 1643
  Colour Plate, Paget. G. E. Whitfield and C. L. Finlay 1425
  Densities, New Bar Photometer for Measuring. W. B. Ferguson ... 382
  Film Distortions on Small Photographic Plates. F. E. Ross 1644
  Film, Non-inflammable Kinematograph. "Cellit." C. R. Hennings 789
  Flare-spots in Photography. G. F. C. Searle 1138
  Negatives, Photographic, Photometry of. G. Neumann 1139
  Phosphorescence, *see* separate section.
  Photochemical Action, Relation between Luminous Energy and. A. Tian 1426
  Plate, Photographic, Action of Ink on. G. de Fontenay 397
  " , " , IX. Latent Image. V. W. D. Bancroft 970
  " , " , Resolving Power of. E. Goldberg 396
  Plates, " , Power of "Solution" of. E. G. Goldberg 1136
  Positives, Direct Photographic. G. A. Perley and A. Leighton 971

7.16
1913

Abstract Nos.

Photography, *continued.*
Recording, Photographic, of Ballistic and other Rapid Phenomena. C. Cranz and B. Glatzel 245
Registration, Photographic, of α-Particles. H. Geiger and E. Rutherford 246
Röntgen Rays, Photographic Action of, *see* section Rays.
Sensitising, Photographic, by Blood Pigments. J. M. Eder........ 1645
Telephotography, First Steps in. E. Marriage........ 591
Under-exposure Period. F. F. Renwick 1417

Photometry.
Flicker Photometer and Iris. H. C. Stevens........ 1814
Heterochromatic Photometry. III., IV., V. H. E. Ives........ 288B
Illumination and Light, Advances in Measurement of. J. S. Dow and V. H. Mackinney........ 589
Industrial and Technical Photometry, *see* Section B.
Measurements, *see* separate section.
Photographic Negatives, Photometry of. G. Neumann........ 1139
„ Photometry. D. A. Goldhammer 1416
Point Sources of Light. C. C. Paterson and B. P. Dudding........ 394
Polarisation Photometers, Limits of Application of. V. Navrat 794
Spectrum Luminosity Curves, Determination of, by Method of Critical Frequency. H. E. Ives, Rayleigh 393
Standard of Light, Electric Arc as. J. F. Forrest........ 1195B
„ „ , Helium Gas. P. G. Nutting 585
„ „ , Primary. H. E. Ives 584

Polarisation (Electrolytic).
Cu/$CuSO_4$ Electrode, Kathodic Polarisation of. D. Reichinstein and A. Zieren........ 2015
Electrolytic Valves, Minimum Voltage of, in Permeable Direction. G. Schulze 1565
E.M.F., Polarisation, of Mixture of Clay, Felspar, and Quartz. A. A. Somerville 118
Measurement of Polarisation; Methodical Error. D. Reichinstein 1911
Overvoltage. J. W. Richards 1913
Passivity of Metals and its Dependence upon Solvent. N. Isgarischew 1917
Reversible Electrodes, Polarisation of. D. Reichinstein, A. Bürger 1912
Valve Action, Electrolytic, of Niobium. U. Sborgi........ 1914

Polarisation (Light, including Magnetic Rotation).
Active Substances, Relation between Temperature and Rotation of. T. S. Patterson 977
Applications of Polarised Light. T. M. Lowry........ 1654
Elliptical Light Vibrations, Slightly, Analysis of. E. Perucca........ 976
Elliptically Polarised Light. L. Chaumont 1427
Experiment on Polarised Light. F. P. Liesegang 407
Formulæ for Polarisation, Transformations in. A. G. Rossi........ 1129
Internal Diffusion, Polarisation of Light by. G. Dimmer........ 1272
Magnetic Rotation of Polarised Light by Liquid Nitrogen and Oxygen. J. Chaudier 979
„ Rotatory Power, Variation of, during Changes of State. J. Chaudier 1428
Magneto-optical Researches. O. M. Corbino 593
„ Rotativity. G. H. Livens 1815
Polarisation of Light due to passage through Slit. P. Zeeman 406
Rotatory Dispersion, Magnetic and Natural. T. M. Lowry 59
„ Dispersive Power of Organic Compounds. I. and II. T. M. Lowry and T. W. Dickson 1652
„ Dispersive Power of Organic Compounds. III. T. M. Lowry 1653
Slits, Fine, in Opaque Screens, Passage of Waves through. Rayleigh 1942

Pressures (High and Low).
Electrical Resistance, Change in, due to Pressure at. H. K. Onnes and B. Beckman 1339

For the **Explanation** of this Index see p. 697.

Abstract Nos

Pressures (High and Low), *continued.*
High Pressures, Dielectric Constant of Air at. A. Occhialini and E. Bodareu 1048, 1496
" Pressures, Effect of, on Physical Behaviour of Solids. J. Johnston and L. H. Adams 1211
" Pressures, Hydrogen from Water and Coal from Cellulose at. F. Bergius 1366
" Pressures, Refractive Indices of Gases under. L. H. Siertsema 1266
Low Pressures, Reactions at. Clean-up of Nitrogen in Tungsten Lamp. I. Langmuir 1890
" Pressures, Sublimation of Metals at. G. W. C. Kaye and D. Ewen 1847
" Pressures, Thermal Conductivity of. A. Trowbridge 1839
" " , very, Chemical Reactions at. I. Langmuir........ 891
Miscibility of Liquids at Pressures up to 3000 Atmospheres. P. Kohnstamm and J. Timmermans 1522
Thermodynamic Properties of Twelve Liquids up to 12,000 kg./cm^2. P. W. Bridgman 1304

Radio-activity.
Actinium Products, Long-period. O. Hahn and M. Rothenbach ... 1298
α- and β-Rays, Charge carried by. J. Danysz and W. Duane 79
" " , Method of Counting. H. Geiger 1873
α-Particle from Polonium, Number of Ions produced by. R. Girard 1673
" , Range and Ionisation of, in Simple Gases. T. S. Taylor 1966
" , Single, Detection of. G. Hoffmann........ 609
α-Particles from Thorium and Actinium Products, Ranges of. H. Geiger and J. M. Nuttall 432
" , Decrease in Velocity of, in passing through Matter. E. Marsden and T. S. Taylor 1837
" , Demonstration of Range of. K. Przibram 80
" , Laws of Deflection of, through Large Angles. H. Geiger and E. Marsden........ 1296
" , Nature of Chemical Action produced by. S. C. Lind ... 271
" , Photographic Registration of. H. Geiger and E. Rutherford 246
" , Relation between Range of, and Number of Charges emitted during Disintegration. A. van den Broek 1295
" , Retardation of, by Metals. E. Marsden and H. Richardson 812
" , Secondary Radiation produced by. B. Bianu 998
" , Single, Tracks of, on Photographic Plate. W. Miehl ... 813
α-Radiation from Uranium, Intensity of. S. Meyer and F. Paneth ... 430
α-Ray Ionisation. H. N. McCoy 1671
α-Rays from Thick Layers. E. v. Schweidler 1672
" , Decomposition of Water by. W. Duane and O. Scheuer...... 1077
" , Relations between Elements emitting. R. Swinne 1000
Atmosphere, Active Deposit in. K. W. F. Kohlrausch 616
Atmosphere, Ionisation of, *see also* section Static Electricity.
β- and γ-Rays from Radio-active Substances, Origin of. E. Rutherford 433
β- and γ-Rays, Ionisation produced by, at High Pressures. D. C. H. Florance 814
β- and γ-Rays, Notes on. J. A. Gray 1967
β and Röntgen Rays, Scattering of, in Crystals. J. Stark 182
β-Particles Reflected by Sheets of Matter of Different Thicknesses. W. Wilson 82
" , Homogeneous, Absorption and Reflection of. W. Wilson 181
" , Number of, Emitted in Transformation of Radium. H. G. J. Moseley 84
β-Radiation of Radium, Variation of. F. v. Lerch 81
β-Rays from Radio-Actinium, Magnetic Spectrum of. O. v. Baeyer, O. Hahn, and L. Meitner 1285

V.1
191

Abstract Nos.
Radio-activity, *continued.*
β-Rays of Radium B, C, D, E. J. Danysz 815
„ , Absorption of. J. A. Gray 610
„ , Passage of, through Matter. J. G. v. Jungenfeld 1838
β-Rays, Reflection of, by Thin Metal Plates. W. B. Huff 83
Coal, Alabama, Radium-content of. S. J. Lloyd and J. Cunningham 1684
δ-Rays produced by β-Rays. N. Campbell 613
„ , Further Experiments on. N. Campbell 434
„ , Velocities of. H. A. Bumstead 1677
„ , Velocity of. F. Hauser 184
Deposit, Radio-active, Collected in Open Air, Half-value of. F. A. Harvey 85
Elements, Radio-active and Periodic System. A. van den Broek ... 708
„ , „ , Valency of. G. v. Hevesy 709
Emanation, Radium, Quantitative Determination of. L. Flamm and H. Mache 75
„ , Radium, Solubility of, in Water. M. Kofler 1742
„ , Radium, Units of Quantity of. J. and G. Danne 183
Emanations, Thorium and Actinium, Comparison of Coefficients of Diffusion of. M[ay] S. Leslie 436
γ- and X-rays, Comparative Absorption of. S. J. Allen and E. J. Lorentz 821
γ-Radiation, Penetrating. A. B. Chauveau 1297
γ-Rays Excited by β-Rays of Radium. J. Chadwick 431
„ from Radium B and Radium C., Analysis of. E. Rutherford and H. Richardson 1675
„ from Radium C, Penetrating Power of. A. S. Russell 816
„ of Radium C, Absorption of. A. Brommer 611
„ , Excitation of, by α-Rays. J. Chadwick 817
„ , „ of, by α-Rays of Ionium and Radio-thorium. J. Chadwick and A. S. Russell 1165
„ , Fluctuations in Ionisation due to. P. W. Burbidge 1861
„ , Fluctuations in Ionisation Produced by. E. Buchwald 187
„ , Interference Phenomena with. A. N. Shaw 1676
„ , Primary, Similarity in Nature of X- and. J. A. Gray 607
„ , Secondary, excited by β-Rays. F. Soddy 612
„ , X-rays, and Photo-electric Rays, Pulse Theory of. W. F. G. Swann 1163
Haloes, Pleochroic, Age of. J. Joly and E. Rutherford 1299
Ionisation Curves, Bragg. P. Bianu 1679
„ in Closed Vessels. J. J. Rey 1678
„ , *see also* sections Dissociation and Discharge.
Ionisations, within Closed Vessels due to Röntgen and Gamma Rays, Comparison of. A. S. Eve 77
Penetrating Radiation, Distribution in Height of. E. Schrödinger 1789
„ „ , Earth's, Measurement of, on Balloon Ascensions. V. F. Hess 823
Polonium, Concentration of. F. Paneth 1743
Potassium, Active Radiation of. H. Thirring 1674
Progress in R[illegible]io-activity Research, 1908–1912. O. Hahn 87
Radio-active [illegible]isintegration Products, Chemical Nature of. A. Fleck 1080
„ „ Elements and Periodic System. K. Fajans 1079
„ „ Elements, Electrochemical Properties of. K. Fajans 1078
„ „ Substances, Electrolysis of. K. F. Herzfeld 895
„ -activity. E. P. Adams 1687
„ „ , Discovery of: Influence on Physical Science. O. Lodge 188
„ -chemistry: Application of Principle of Relativity. R. Swinne 1076
„ -elements and Periodic Law. F. Soddy 1075
„ „ , Chemical Characteristics and Series of Transformations. G. v. Hevesy 131
„ -elements, Periodic System and. A. S. Russell 1074
„ -thorium, Growth of, from Meso-thorium 2. J. A. Cranston 1682

7.16
1913

Abstract Nos.

Radio-activity, *continued.*
  Radium and its Emanation, Heating Effect of. E. Rutherford and H. Robinson 820
    „ E. R. Thaller 819
    „ Radiations, Influence of, on Glass and Minerals. S. Meyer and K. Przibram 524
    „ Rays (β and γ), Action of, on Inorganic Compounds. A. Kailan 715
    „ Rays (β and γ), Action of, on Organic Compounds. A. Kailan 716
    „ Rays, Chemical Action of, on Cane Sugar. A. Kailan 1741
    „ , Heating Effect of. V. F. Hess 711
    „ , Occlusion of Products of. Costanzo 999
    „ , Solubility of Active Deposits of. E[va] Ramstedt 1744
  Recoil Atoms in Ionised Air. A. F. Kovarik 614
  Sea-water, Emanation in. J. Laub 822
  Secondary Rays, Asymmetric Emission of. O. W. Richardson 818
  Sediments, Hot-spring, Radio-activity of. M. Hayakawa and T. Nakano 1443
  Sodium as Member of Radio-active Series. F. C. Brown 710
  Soil, Emanation from, to Atmosphere. L. B. Smyth 189
  Spring Water, Emanation of. W. Hammer and F. Vohsen 1683
    „ Waters, Estimation of Emanation Content of. G. Berndt 186
  Springs, Hot, of Iizaka, Radio-activity of. D. Isitani and K. Manabe 619
    „ , „ , of Kinosaki, Radio-activity of. D. Isitani and K. Manabe 437
    „ , Hot, of Yosina, Radio-activity of. D. Isitani 86
    „ , „ , in Beppu Region, Radio-activity of. D. Isitani and I. Yamakawa 1688
  Standard Radium Preparations, Vienna. S. Meyer and V. F. Hess 76
    „ , International Radium. Mme. P. Curie 78
    „ , „ „ . E. Haschek and O. Hönigschmid 1670
  Thorium, Activities of Radio-products of. H. N. McCoy and C. H. Viol 1217
  Terrestrial Surface Materials, Radio-activity of. J. Joly 435
  Thorium Emanation, Number of α-Particles emitted by. J. Satterly 608
    „ , Solubility of Active Deposit of. C. F. Hogley 1091
  Uranium and Thorium, Transformation Periods of. H. N. McCoy 1681
    „ Nitrate, Variation in Activity of. M. La Rosa 1001
    „ Salts, Radio-activity of Solutions of. L. Michiels 615
    „ X, Electrochemical Properties of. P. Rossi 899
    „ Y, Existence of. A. Fleck 1680
  Water issuing from Monte Amiata, Radio-activity of. R. Nasini and C. Porlezza 185

Rays and Radiation.
  Anode Rays, Formation of. O. Reichenheim 1989
  Black Radiation, Mechanism of. A. Korn 1980
    „ „ , Theory of. M. Brillouin 645, 829
  Canal Rays and Electronic Affinity. J. Franck 1714
    „ „ , Doppler-effect of. H. Wilsar 600
    „ „ , Emission of "Rest" Series Lines by. J. Stark 1957
    „ „ , Generation of Light by. L. Vegard 1183
    „ „ , Influence of Gas on Disintegration by. V. Kohlschütter 223
    „ „ , Lines of Aluminium, Argon and Mercury in. J. Stark, G. Wendt, H. Kirschbaum, and R. Künzer 1960
    „ Rays, Primary Velocity of. K. Glimme and J. Koenigsberger 1184
    „ „ , Reflection of. J. Stark 1959
    „ „ , Secondary Rays Liberated by. H. Baerwald 220
    „ „ , Transmission of, through Thin Partitions. A. N. Goldsmith 1715
  Catathermic Rays. J. A. Le Bel 1693
  Dark Radiation, Basis of Law of. E. Marx 1309

V.1
191

7.16
.913

Abstract Nos.

Rays and Radiation, *continued.*
Diffraction of Electric Waves by Crystal. L. S. Ornstein.............. 1666
„ of Electro-magnetic Waves by Crystal. W. L. Bragg ... 989
„ Patterns from Crystals. H. S. Allen 1161
Emission and Absorption by Flames. R. Ladenburg.................. 974
„ from Tungsten and Carbon at Glowing Temperatures. A. G. Worthing 392
„ of Light and Molecular Impact. H. Pettersson.............. 797
Emissivity of Oxidised Metallic Surfaces. C. P. Randolph and M. J. Overholser 1969
„ of Solid and Liquid Copper at High Temperature. C. M. Stubbs 1005
„ of Solid and Liquid Gold. C. M. Stubbs and E. B. R. Prideaux 442
Heat, Convection and Radiation of. I. Langmuir 1974
Hefner Lamp, Total Radiation of. W. Gerlach 1813
Imprisonment of Radiation by Total Reflection. R. W. Wood 1127
Kathode Rays. S. Rudberg 663
„ „ , Pressure of. E. v. Angerer 1328
„ „ , Slow, Reflection of. L. Houllevigue 484
Kirchhoff's Law. F. Richarz... 97
„ „ , Denial of, for Heterogeneous Bodies. W. Voigt ... 197
Long-wave Radiation in Gases; Effect of Pressure. E[va] v. Bahr... 1973
Luminous Efficiency and Colour Index of Black Body. H. N. Russell 1646
„ Efficiency throughout Visible Spectrum. R. A. Houstoun 1648
„ Energy absorbed in Photochemical Reaction, Determination of. A. Tian 1647
Mercury Vapour, Long-wave Radiation of. H. Rubens and O. v. Baeyer 1822
Molecular Theory of Radiation, and Photochemical Law. J. Ishiwara 464
Penetrating Radiation, Earth's, Intensities of, on Land and Sea. J. C. McLennan 617
Platinum Black, Dispersive Power of. C. Féry and M. Drecq......... 630
Positive Electricity, Rays of. J. J. Thomson 1862
„ Rays, W. Wien.. 112
„ „ , Further Applications of, to Study of Chemical Problems. J. J. Thomson 1210
Potassium, Active Radiation of, H. Thirring 1674
Pressure of Light by Use of Thin Foil. G. D. West 1945
Radiation Constant. L. Puccianti 196
„ „ . H. B. Keene 638
„ „ , Wien-Planck's. E. Warburg, G. Leithäuser, E. Hupka, and C. Müller 640
„ Law, Constant in. J. de Boissoudy 1307
„ Measurements. II. W. Gerlach 1308
„ Theory. D. Hilbert 462, 1850
„ , Atomic Theories of. R. A. Millikan............................... 830
„ , Theory of. S. B. McLaren... 639
Radiations Old and New. W. H. Bragg.................................. 618
Radio-activity, *see* separate section.
Residual Rays, New Groups of, in Region of Long Wave-lengths. H. Rubens 1447
Röntgen and β-Rays, Scattering of, in Crystals. J. Stark 182
„ and Kathode Rays, Relations between. R. Whiddington, A. A. Campbell-Swinton 1288
„ Radiation from Kathode Particles traversing Gas. R. Whiddington 996
„ Radiation, Fluorescent, Production of. J. C. Chapman...... 997
„ „ , „ „ . W. H, Bragg 1164
„ „ , Polarised, Experiments on. J. C. Chapman...... 1669

For the **Explanation** of this Index see p. 697.

Abstract Nos.

Rays and Radiation, *continued.*
Röngten Radiation, Reflection of. C. G. Barkla and G. H. Martyn ... 180
„ „ , Secondary, from Carbon, Quality of. H. Pealing ... 605
„ Radiations, Direct Production of, by Kathode Particles. R. T. Beatty ... 606
„ Radiations, Fluorescent, Comparison of Spectra of. J. C. Chapman ... 811
„ Ray Interference. P. Debye ... 1964
„ Rays, Distribution of, from Platinum Antikathode. W. Friedrich ... 129
„ Rays : Effect of Thermal Movements on Interference. P. Debye ... 1963
„ Rays, Interference Bands from. E. Hupka and W. Steinhaus ... 994
„ Rays, Interference of. G. Wulff ... 1157
„ „ , „ Phenomena with. W. Friedrich, P. Knipping, and M. Laue ... 1153, 1686
„ Rays, Ionisation by. F. Lebeau ... 849
„ „ , Multiple Images by, after Traversing Crystal. M. de Broglie ... 1154
„ Rays, Production of, by Slowly-moving Electrons. H. Dember ... 1828
„ Rays, Recombination of Ions produced by. S. J. Plimpton ... 848
„ Rays, Reflection of. M. de Broglie ... 1155
„ „ , „ . L. Mandelstam and H. Rohmann ... 1158
„ „ , Spectrum of. J. Herweg ... 1831
Secondary Rays, Asymmetric Emission of. O. W. Richardson ... 818
Spectral Radiation of Uniformly Heated Enclosure. W. W. Coblentz ... 1004
Stefan Law of Radiation, Constant of. W. H. Westphal ... 460
Temperature Radiation of CO_2. H. Schmidt ... 1972
Thermal Radiation from Hot Gases. W. T. Daird ... 1002
„ Waves, Longest, Resonance with. R. W. Wood ... 1003
Tungsten Lamps of High Efficiency. I. Langmuir ... 1283B
„ „ , Nitrogen-filled. I. Langmuir and J. A. Orange ... 1284B
X- and γ-Rays, Comparative Absorption of. S. J. Allen and E. J. Lorentz ... 821
X- and Primary γ-Rays, Similarity in Nature of. J. A. Gray ... 607
X-radiation, Structure of. W. F. D. Chambers and I. G. Rankin ... 1962
X-ray Diffraction in Gypsum. J. Herweg ... 1294
„ Fluorescence. W. Kaufmann ... 1286, 1442
„ Interference Patterns. M. Laue and F. Tank ... 1834
„ „ Phenomena in Non-crystalline Bodies. W. Friedrich ... 1290
„ Interference, Theory of. P. P. Ewald ... 1667
„ Spectra. E. A. Owen and G. C. Blake ... 1159
X-rays and Crystals. T. Terada ... 1160
„ „ . E. Hupka ... 1664
„ „ . M. de Broglie ... 1668
„ „ . W. H. Bragg ... 1832, 1835
„ and X-ray Spectra, Photographic Effect of. C. G. Barkla and G. H. Martyn ... 992
„ , Diffraction and Reflection of. de Broglie ... 1685
„ , Frequency of, W. Seitz ... 1961
„ , γ-rays, and Photoelectric Rays, Pulse Theory of. W. F. G. Swann ... 1163
„ , Hard. F. Dessauer ... 1208
„ , Nature of. C. G. Barkla ... 1836
„ , Passage of, through Metals. E. Hupka ... 1829
„ , Peripheral Effect with. W. F. D. Chambers and I. G. Rankin ... 1291

For the Explanation of this Index see p. 697.

V.1
191

.16
013

Abstract Nos.

Rays and Radiation, *continued.*
X-rays, Reflected. E. Hupka 1162
„ , Reflection of. H. G. J. Moseley and C. G. Darwin........ 990, 1833
„ , „ : W. H. Bragg 991
„ , „ : C. G. Barkla and G. H. Martyn........ 993
„ , „ . H. B. Keene 995
„ , „ . M. de Broglie........ 1156
„ , „ . J. Stark 1289
„ , „ : M. Laue 1292
„ , „ . M. de Broglie and F. A. Lindemann 1665
„ , „ , by Crystals. W. H. Bragg and W. L. Bragg ... 1830
„ , Specular Reflection of. W. L. Bragg 604
„ , Transmission of, through Crystals. T. Terada........ 1663
„ , „ of, through Metals. H. B. Keene 1965
„ , Vibration Frequency of. G. Zemplén........ 1293

Reflection of Light.
Diffuse Reflection, Emission and. F. Jentzsch........ 404
Measurements, *see* separate section.
Röntgen Rays, Reflection of, *see* section Rays.
Sodium and Potassium, Optical Constants of. R. W. and R. C. Duncan 1269
Total Reflection, Imprisonment of Radiation by. R. W. Wood 1127

Refraction of Light.
Atmospheric Refraction, Irregularities in. F. Schlesinger........ 939
Birefringence of Cortical Substance of Animal Hairs. A. Pochettino 1415
Double Refraction of Optical Glass. H. Schulz........ 1807
„ „ „ . E. Zschimmer and H. Schulz... 1939
„ „ of Strained Glass: Influence of Temperature. E. Zschimmer 53
„ Refraction of Unannealed Glass. H. Schulz........ 388
„ „ produced by Distortion of Elastic Bodies. O. M. Corbino 793
„ Refraction, Electric. C. Gutton 1131, 1267
„ „ , „ , and Magnetic. W. Voigt 66, 800
„ „ , „ , in Artificial Clouds. P. Zeeman and C. M. Hoogenboom........ 54
„ Refraction, Imitation of, by Glass Plates. E. Terlanday...... 386
„ „ , Magnetic, of Liquid Mixtures. A. Cotton and H. Mouton 1413
Formulæ for Refraction, Transformations in. A. G. Rossi 1129
Gaseous Compounds, Refraction and Dispersion of. C. Cuthbertson 1130
Gases, Refraction in, *see also* separate section.
„ , Refraction of, at Different Temperatures and Pressures. H. D. Ayres 1940
Glass, Fluor-crown. E. Zschimmer 1128
„ , Optical, Limits of Uniformity in producing. J. W. Gifford ... 51
Halogens, Ozone, Steam, and Ammonia, Refraction of. C. and M. Cuthbertson 1642
Index of Refraction of Liquid Hydrogen. W. Meissner 1809
Indices of Doubly-refracting Crystals by Displacement Interferometry. C. Barus 387
Liquid Mixtures especially suitable for observing Christiansen's Phenomenon. F. Bodroux 969
Measurements, *see* separate section.
Mixtures, Refraction of. P. T. Muller and Mlle. V. Guerdjikoff...... 174
Optical Properties of Substances at Critical Point. C. Smith 173
"Refraction Constant," Carbon Disulphide as Solvent for Determination of. F. Schwers 172
Refractive Index and Density of Liquids in Contact. A. L. Clarke 171
„ „ for Water, Temperature Change of. F. A. Osborn 966
„ „ of Selenium. W. S. Gripenberg 965
Röntgen Rays, Refraction of, *see* section Rays.

For the Explanation of this Index see p. 697.

Abstract Nos.

Refraction of Light, *continued.*
Salts in Water, Refraction of. A. Heydweiller ... 1752
Sodium and Potassium, Optical Constants of. R. W. and R. C. Duncan ... 1269
Solar Atmosphere, Refraction of. R. S. Capon ... 1597
Spectre of the Brocken, and Halo in Ricefield. [Miss] A. Everett... 592
Torque by Beam of Light in Oblique Refraction through Glass. G. Barlow ... 967
Water, Optical Properties of. C. Chéneveau ... 1419
„ , „ „ of Ions in. A. Heydweiller ... 581

Solution and Solubility.
Brownian Movements, *see* section Molecular Physics.
Carbon Dioxide, Solubility of, at Pressures below Atmospheric. A. Findlay and T. Williams ... 1370
Colloid, Suspension, Neutral Oil Emulsion as Model of. R. Ellis ... 1906
Concentration, Spontaneous Variations of. T. Svedberg ... 730
„ , „ „ . E. v. Schweidler ... 1218
Conductivity, *see* separate section.
Dilution, Heats of. W. F. Magie ... 736
Fluidity and Conductivity of Strong Solutions. W. S. Tucker ... 1089
„ of Ammonia, Methylamine, and SO_2. F. F. Fitzgerald ... 288
Miscibility of Liquids at Pressures up to 3,000 Atmospheres. P. Kohnstamm and J. Timmermans ... 1522
Oxides and Sulphides, Metallic, Solubility of, in fused NaCl. H. Houben ... 287
Radium Emanation, Solubility of, in Water. M. Kofler ... 1742
„ , Solubility of Active Deposit of. E[va] Ramstedt ... 1744
Salts, Refraction, Dispersion, and Dissociation of, in Water. A. Heydweiller ... 1752
Sodium Sulphate Decahydrate as Solvent, Cryoscopy in. A. Boutaric and C. Leenhardt ... 137
Solubility and Supersolubility from Osmotic Standpoint. Berkeley 312
Specific Gravity, Unusual Case of. A. L. Hyde ... 269
Thorium, Solubility of Active Deposit of. C. F. Hogley ... 1091
Viscosity, *see also* separate section.

Sound.
Artificial Hiss. E. R. Marle, H. L. Kiek, E. B. Titchener ... 1312
Auditorium Acoustics and Air-currents. F. R. Watson ... 1019
Axial Emission of Sound in Cylindrical Tube. M[ary] Taylor ... 199
Combination Tones with Strings and Membranes. C. Schaefer and E. Juretzka ... 1702
Combination Tones, Objective. E. Waetzmann and G. Mücke ... 1318
„ „ , Physical Objectivity of. E. Waetzmann and G. Mücke ... 649
Combination Tones, Subjective, Origin of. J. Peterson ... 1314
Complex and Intermittent Sounds. Marage ... 1315
Consonants, Phonographic Investigations of. L. Réthi ... 1020
Duration of Sound of Alloys as Function of Temperature. F. Robin 100
Dust-Figures. J. Robinson ... 1852
Edge Tones, Theory of. W. König ... 1316
Fork, Compound Vibrations of. E. H. Barton ... 647
Phonographic Waves, Exhibition of. H. Benndorf and R. Pöch ... 203
Pianoforte Touch. G. H. Bryan ... 1177
„ „ . S. Pickering ... 1851
Pipes, Reed, with Conical Portions. E. Hoppe ... 103
Pitch, Sensibility to. II. H. Muraoka ... 1311
„ , Time Needed for Perception of. G. Leimbach ... 101
Relative Sound Intensities and Rayleigh Disc. G. W. Stewart and H. Stiles ... 1310
Resonance, Range and Sharpness of, under Sustained Forcing. E. H. Barton ... 1701
Sound Vibration Curves. D. C. Miller ... 102

V.1
191

.16
913

Abstract Nos.

Sound, *continued*.
Sound-waves, Photography of. A. L. Foley and W. H. Souder 201
Speed of Sound in Homogeneous Fluid. Ariès 1704
Strings, Transverse Vibrations of. G. Sizes 1178
Telephone Tones, Application of Resonators to. M. Wien 648
Thunder. W. Schmidt 1317
Tuning-fork, Upper Partials of. F. H. Parker 202
Vibrations, Maintenance of, by Variable Spring. C. V. Raman 200
Violin Sound-waves, Analysis of. C. W. Hewlett 646

Specific Heat and Latent Heat.
Atomic Heats. W. Nernst and F. A. Lindemann 447
Capacity for Heat of Metals at Different Temperatures. E. H. Griffiths and E. Griffiths 1841
Chemical Affinities. W. Nernst 448
Latent Heat of Evaporation of Aqueous Salt Solutions. R. G. Lunnon 1303
„ Heat of Vaporisation of Metals. E. van Aubel 1007
„ Heats of Chloroform and Benzene. J. Fletcher and D. Tyrer 1302
„ „ of Vaporisation and Maximum Pressures. A. Leduc 1008
Specific and Latent Heats of Fusion of Alkaline Metals. E. Rengade 1690
„ Heat and Free Electrons. O. Richter 445
„ „ and Specific Volume of Steam up to 20 Atmospheres and 550° C. M. Jakob 106B
„ Heat of Diatomic Gases. P. Ehrenfest 1445
„ „ of Elements at Low Temperatures. T. Estreicher and M. Staniewski 195
„ Heat of Gases, Relation to Experiments on ; Conduction of Heat along Pipe. W. F. G. Swann 825
„ „ of Hydrated Salts. L. Rolla and L. Accame 1842
„ Heat, Theory of. M. Born and T. v. Kármán 626
„ Heats at High Temperatures. A. Magnus 625
„ „ at Low Temperatures, Determination of. F. Pollitzer 1846
„ „ of Crystallised Salts. F. G. Jackson 444
„ „ of Helium and some Gases between + 20° and — 180°. K. Scheel and W. Heuse 827
„ Heats of Liquids at Constant Pressure. S. Lussana 89
„ „ „ , Data concerning Dilute Acids and Alkaline Hydroxides. T. W. Richards and A. W. Rowe 1843
„ Heats of Metals, Measurement of, at High Temperatures. O. M. Corbino 1166
„ Heats of Solids at High Temperatures. M. v. Pirani 449
„ „ „ at Low Temperatures. A. Eucken and F. Schwers 1844
„ Heats, Calculation of, from Elasticities. A. Eucken 1845
„ „ , Equation of State for Solids and Theory of. E. Rasch 73
„ „ , Mean Atomic, at 50° Abs. of Elements a Periodic Function of Atomic Weights. J. Dewar 1968
„ Heats, Ratio of. A. Leduc 441
„ „ , Researches on. I. J. N. Brönsted 92
„ „ , Theory of. P. Debye 446

Spectra.
Absorption by Solutions of Copper, Cobalt, and Nickel Salts in Ultraviolet. A. R. Brown 1278
„ of Light by Aqueous Solutions of Iron-Salts. J. S. Anderson 1277
„ Spectra in near Infra-red. A. H. Pfund 1812
„ „ , Photography of. T. R. Merton 595
Air and Hydrogen, Spectra of Low-potential Discharges in. G. S. Fulcher 417
„ , Nitrogen, and Oxygen, Goldstein's Method and Spectra of. J. Scharbach 1429

Abstract Nos.

Spectra, *continued.*

Aluminium, Argon and Mercury, Lines of, in Canal Rays. J. Stark, G. Wendt, H. Kirschbaum, and R. Künzer 1960
„ , Cadmium, Zinc, Band Spectra of. E. E. Howson 416
Arc between Metal Rods, Emission in. H. Könemann 1149
„ , Carbon, Spectrum of, at Low Pressures. M. La Rosa 984
Band Spectra, Theory of. J. Stark 1279
„ „ , Use of Interferometer for Study of. R. W. Wood 1662
Barium Lines and Barium Fluoride, Band Spectrum of. H. George 1434
Calcium, Arc and Spark Spectra of. O. Holtz 1274
Canal-ray Spectra, Arc and Spark Lines in. J. Stark 803
„ „ Spectrum, Intensity Distribution in. J. Stark 601
„ Rays, Doppler-effect of. H. Wilsar 600
„ „ , Emission of "Rest" Series Lines by. J. Stark 1957
Carbon Monolsulphide, Band Spectrum attributed to. L. C. Martin 1949
D-Lines Emitted by Sodium Salts. K. Iwanow 422
Emission, Absorption, and Intensity Distribution of Spectral Lines. F. Reiche 594
Gases, Absorption of, in Infra-red. E[va] v. Bahr 1946
„ , Infra-red Absorption Spectra of. W. Burmeister 1824
„ , Long-wave Radiation in: Effect of Pressure. E[va] v. Bahr 1973
„ , Various, Band Spectra of. F. Burger and J. Koenigsberger 597
Halogen Salts, Flame Spectra of. E. N. da C. Andrade 1816
Helium and Neon, Appearance of, in Vacuum Tubes. J. N. Collie, H. S. Patterson, and A. Fowler 804
„ Spectrum. E. Goldstein 1433
„ , New Band Spectrum associated with. W. E. Curtis 1947
„ , Spectrum of, in Canal Rays. J. Stark, A. Fischer, and H. Kirschbaum 982
Hydrogen, Extension of Spectrum of. J. W. Nicholson 1656
Intensity Distribution in Spectral Lines, Measurement of. P. P. Koch 1950
„ , Distribution of, within Spectrum Line. W. Voigt 1430
Iodine Vapour, Fluorescence Spectrum of. J. C. McLennan 1284
„ , Resonance Spectra of, by Multiple Excitation. R. W. Wood 801
Ionium, Investigation of Spectrum of. A. S. Russell and R. Rossi 413
„ , Spectroscopic Investigation of. F. Exner and E. Haschek 412
Iron Spectrum for Wave-length References. L. Glaser 408
„ Arc, Spectrum of, with Alternating Current. M. Hamy 61
„ , „ „ of. F. Goos 60
„ , „ „ of. K. Burns 1436
„ , „ „ of Normal Wave-lengths in. F. Goos 1435
„ , Electric-furnace Spectrum of. A. S. King 1817
„ , Measurements of Wave-lengths in Spectrum of. K. Burns 1431
Kathode-ray Line, Beaded Character of. C. T. Knipp 1868
Krypton, Wave-lengths of. H. Buisson and C. Fabry 981
Lead, Arc and Spark Spectrum of. F. Klein 802
Magnesium Spectrum. A. Nacken 978
„ , Additional Triplets in Spectrum of. A. Fowler and W. H. Reynolds 1955
„ , New Series in Spark Spectrum of. A. Fowler 1948
Mercury and Tin, Dispersion and Absorption of. P. Erochin 74
„ Arc Spectrum, Series Lines in. J. C. McLennan 62
„ Line, 5461 Å, Structure of. L. Janicki 65
„ Lines and Bands. J. Stark and G. Wendt 1821
„ „ , Satellites of. R. W. Wood 1148
„ „ , Structure of. H. Nagaoka and T. Takamine 424
„ Vapour, Distribution of Long-wave Radiation of. H. Rubens and O. v. Baeyer 1822
„ , Band Spectra of. J. Stark and G. Wendt 1820
„ , „ Spectrum of. E. Liese 418

V.1
191

7.16
.913

Abstract Nos.

Spectra, *continued.*
Neodymium and Praseodymium, Absorption Spectra of, Solutions of. H. C. Jones and J. S. Guy 63
„ Compounds, Reflection Spectra of. P. Joye 1951
Neon, Wave-lengths of. I. G. Priest 410
Nitrogen Spectrum. M. Hamy 1661
Oxygen, Ultra-violet Band Spectrum of. W. Steubing 599
Ozone, Absorption of Ultra-violet Light by. C. Fabry and H. Buisson 980
Palladium, Spark Spectrum of. P. E. Dhein 72
Photo-spectrography with Concave Gratings. C. P. Butler 588
Platinum, Arc Spectrum of. E. Symons 1437
Platinum, Palladium, and Tantalum, Spectra of. G. V. McCauley 1658
Prismatic and Grating Spectra, Relative Intensity of. J. S. Plaskett 1659
Röntgen Rays, Wave-lengths of, *see* section Rays.
Series Spectrum Lines, Damping of. C. Schaefer 1660
„ , Spectral, Convergence Frequency in. F. Sanford 427
„ , Translation, in Line Spectra. T. van Lohuizen 179
Silicon and Titanium, Spectra of Tetrachlorides of. W. Jevons 1823
Sodium Line D_1, New Measurement of Optical Parameters of. K. Iwanow 425
Solar Spectrum, *see* section Astronomy.
Spark Spectra of Non-metallic Elements: Effect of Self-induction. G. V. Morrow 1275
Spectral Series, Critical Study of. III. W. M. Hicks 1953
Spectroscopic Apparatus, *see* section Apparatus.
Standards, Wave-length. C. Fabry and H. Buisson 1952
Stellar Spectra, *see* section Astronomy.
Tellurium Vapour, Absorption Spectrum of. E. J. Evans 414
„ , Arc Spectrum of. H. S. Uhler and R. A. Patterson 1657
Tin and Antimony, Series in Spectra of. T. van Lohuizen 596
Titanium, Enhanced Lines of, in Electric Furnace Spectra. A. S. King 1655
Ultra-red Emission Spectra. H. Lehmann 64
„ -violet Magnetic Rotation in Gases. J. F. Sirks 409
„ „ Rays, Absorption of. V. Henri 1818
„ „ „ , Absorption of, by Acetone. J. Bielecki and V. Henri 1819
Uranyl Salts, Absorption Spectra of. A. Mazzucchelli and O. G. d'Alceo 415, 805
Vegard's Researches, Remarks on. J. Stark 1150
Water-vapour, Absorption of, New Groups of Residual Rays in Region of Long Wave-lengths and. H. Rubens 1447
„ -vapour, Absorption Spectrum of. E[va] v. Bahr 1954
„ „ , Ultra-violet Band of, $(\lambda = 3064)$. L. Grebe and O. Holtz 411
Wave-length Measurements. H. Kayser 1432
Zeeman-effect, *see* separate section.
Zinc, Cadmium, and Mercury, Series in Spectra of. J. Stark 598
„ , „ , „ , „ „ . F. Paschen 985

Static and Atmospheric Electricity, *see also* sections Discharge and Radio-activity.
Atmosphere, Active Deposit in. K. W. F. Kohlrausch 616
„ , Large Ions in. J. A. McClelland and H. Kennedy 213
„ , „ „ . H. Kennedy 1323
„ , Variations of Conductivity of, and of Air-earth Current at Potsdam. K. Kähler 476
Atmospheric Electricity. G. C. Simpson 658
„ „ , Measurements of, during Partial Eclipse, 1912. A. Brommer 475
„ Electricity, Observations at Seeham. E. v. Schweidler 474, 1855

For the **Explanation** of this Index see p. 697.

Abstract Nos.

Static and Atmospheric Electricity, *continued.*

Atmospheric Electricity, Observations of, in Argentina. G. Berndt 1856
„ Potential. E. MacLennan 1023
Conducting Spheres, two, Electric Attraction between. A. Guillet and M. Aubert 238
Contact Electricity, *see* section Batteries, Primary.
Dust-clouds, Electrification associated with. W. A. D. Rudge 1182
„ -Figures produced by Electric Sparks. E. H. Barton and W. B. Kilby 472
„ -Figures, Electric, on Electrophorus Plate. G. Quincke 844
„ Storms, S. African, Atmospheric Electrification during. W. A. D. Rudge 657
„ Storms, Atmospheric Electrification during. V. H. Jackson 1025
Electric Waves occurring in Nature, Diurnal Variations of. W. H. Eccles 109
Electrification by Liquid Dropping. K. v. Bernolák 212
„ by Spraying Liquids. C. Christiansen 468, 842
„ by X-rays. C. G. Bédreag 1706
High Potentials, Attainment of, by Use of Radium. H. G. J. Moseley 1872
Hydroelectric machines. A. Bernini 249
Induced Radio-activity, High Value of, and of Conductivity in Cordilleras. W. Knoche 473
Lightning Conductors, Horned, and Related Phenomena. H. Greinacher 1024
„ Photographs, Stereoscopic. B. Walter 656
Residual Charge and Vibration. P. L. Mercanton 654
Screening, Electric, by Silver Films. [Miss] S. Hyatt 214
Surface Charges on Conductors in Vacuum. E. Gehrcke and R. Seeliger 1456
Two Conducting Spheres, Electric Spark-gap formed by. A. Guillet and M. Aubert 239
„ Electrified Spherical Conductors, Problem of. G. R. Dean 471
„ Spheres, Problems relating to. G. B. Jeffery, A. Russell 469

Surface Tension.

Capillary Surface, Shape of. A. Ferguson 344
Composite Fluid Surfaces, Tension of. W. B. Hardy 1394
Drops and Bubbles, Shapes of. A. Ferguson 1244
Films, Elastic Liquid, Savart's Theory of. J. Boussinesq 1387
„ , Liquid, and Foaming of Solutions. S. A. Shorter 349
„ , Rotating Liquid, Experiments with. C. V. Boys 1929
Gases, Capillary Phenomena in. G. Reboul 915
Glycerine Solutions, Temperature Variation of Capillarity of. J. Skala 345
Mercury, Change of Surface Tension of, by Metallic Amalgams. F. Schmidt 346
Slipping of Liquids at Partitions. R. Détrait 1390
Solids, Molten, Capillary Constant of, by Dimensions of Drops. A. Ignatiev 1928
Solutions and Suspensions of Soap, Surface Tension of. F. Bottazzi 20
Superficial Layer separating two Liquids, Equilibrium of. J. Boussinesq 1385
Surface Potential Energy in perfect Liquids. J. Boussinesq 1386
Transition Layers and Surface Tension. R. D. Kleeman 343
Viscosity; Drop falling within Fluid of Lower Density. J. Boussinesq 913
„ , Superficial, Existence of, in Thin Transition Layer. J. Boussinesq 912
Visibility of Foreign Substances on Surface of Pure Water. H. Labrouste 1388

Temperature.

Nitrogen Thermometer Scale from 300° to 630°. A. L. Day and R. B. Sosman 93
Temperature Scales, Relative, of Solids. H. Alterthum 641
„ „ , *see* also section Thermometry.

For the **Explanation** of this Index see p. 697.

V.1
191

.16
913

Abstract Nos.

Temperatures, High and Low.

High-temperature Gas Thermometry. A. L. Day, R. B. Sosman, and E. T. Allen 450

High Temperatures, Changes in Iron and Steel at. K. Honda and H. Takagi 516

„ Temperatures, Gas Thermometer as Basis for Measuring. F. Henning 1698

„ Temperatures: Influence on Properties of Alloys. I. M. Bregowsky and L. W. Spring 1084

„ Temperatures, Specific Heats at. A. Magnus 625

„ „ , „ „ of Metals at. A. M. Corbino ... 1166

„ „ , „ „ of Solids at. M. v. Pirani 449

„ „ , Magnetic Susceptibility at. K. Honda and H. Takagi 699

Low Temperature, Change in Resistance due to Pressure at. H. K. Onnes and B. Beckman 1339

„ Temperature, Thermal Properties of Carbonic Acid at. C. F. Jenkin and D. R. Pye 1849

„ Temperature, Viscosity at. I. Hydrogen. II. Helium. H. K. Onnes, C. Dorsman, and S. Weber 1446

„ Temperatures, Absorption of Light in Benzene at. J. de Kowalski and E. Banasinski 50

„ Temperatures, Determination of Compressibility of Gases at. W. J. de Haas 636

„ Temperatures, Determination of Specific Heats at. F. Pollitzer 1846

„ „ , Resistance of Pyrites Crystal at. B. Beckman 1493

„ „ , Hall-effect at. H. Alterthum 1065

„ „ , „ at. H. K. Onnes and B. Beckman... 1351

„ „ , „ in Metals at. H. Alterthum............ 508

„ „ , „ in Tellurium and Bismuth at. H. K. Onnes and B. Beckman 1353

„ Temperatures, Magnetic Properties of Steels at. J. G. Gray and A. D. Ross 259

„ Temperatures, Piezo- and Pyro-electric Properties of Quartz at. H. K. Onnes and A. Beckman 1494

„ Temperatures, Specific Heat of Elements at. T. Estreicher and M. Staniewski 195

„ Temperatures, T^3 Law for Decrement of Specific Heats at. A. Eucken and F. Schwers 1844

Measurements, *see* separate section.

Melting-point of Hydrogen, Hall-effect for Gold-Silver Alloys at. B. Beckman 1352

— 211° C., Use of Liquid Nitrogen for producing Temperatures to. G. Claude 1695

Terrestrial Magnetism and Electricity.

Atmospheric Electricity, *see* section Static Electricity.

Magnetic Determinations and Chart Corrections obtained by "Carnegie," 1911–1912. L. A. Bauer and W. J. Peters 264

„ Disturbances, Earth Currents, and Solar Eruptions. J. Bosler 521

„ Disturbances, Sun-spots, and Solar Corona. A. L. Cortie 262

„ Effect of Oceans. A. Berget 520

„ Observations during Solar Eclipse, 1912, April 17. G. van Dijk 1733

„ Observations, Land, 1905–1910. L. A. Bauer 1737

„ Storm, Artificial. F. E. Nipher 1884

„ Variation, New Analytical Expression for. G. W. Walker 1735

Meteorology, *see* separate section.

Solar Magnetism. K. Birkeland 1935

Storms, Magnetic, and Hysteresis Phenomena. J. Bosler 1207

Terrestrial Magnetic Phenomena and Sun-spots. A. L. Cortie 701, 877, 1734

Abstract Nos.

Terrestrial Magnetism and Electricity, *continued.*
Terrestrial Magnetism, Atmospheric Electricity, and Light Intensity during Eclipse of 1912. W. Kohlhörster ... 702
„ Magnetism, Conservation and Origin of. K. Birkeland... 2008
„ „ , Influence of Alps on Secular Movement of Elements of. J. Maurer ... 1520

Terrestrial Physics.
Air in Depths of Ocean. C. Juday ... 1934
Atmosphere, Colours of. A. Heim ... 1592
„ , New Element in. F. W. Aston ... 2010
Change in Sea-level, Periodic, at Helder. H. G. van de Sande Bakhuyzen ... 1398
Deep Wells at Findlay, Ohio, Temperature in. J. Johnston ... 1589
Deformation, Terrestrial. A. Romieux ... 1397
Earth Movements and Terrestrial Gravity. J. W. Spencer ... 1400
Earthquake Waves, Longitudinal, Determination of Azimuth of. H. Benndorf ... 1588
Earth-tides. T. Shida ... 32
Earth's Crust and Earth, Elasticity of. T. Shida, M. Matsuyama ... 1258
„ Rotation Demonstrated. A. H. Compton ... 1257
Evaporation, Annual, from Swiss Lakes, Amount of. J. Maurer ... 1792
Geoids, Determination of, in Harz District. F. R. Helmert ... 1401
Haloes, Pleochroic, Age of. J. Joly and E. Rutherford ... 1299
Ice Ages: Factors in Production of Climatic Changes. W. J. Humphreys ... 1586
Icebergs and Temperature of Sea-water. J. Aitken, H. T. Barnes ... 775
Megaseisms and Lunar Phases. de M. de Ballore ... 1396
Metals, Ultimate Source of. B. Stevens ... 1395
Miscroseismic Oscillations and Surface Waves. C. Mainka ... 1591
Ocean Temperatures in Vicinity of Icebergs. C. W. Waidner, H. C. Dickinson, and J. J. Crowe ... 1793
Polar Fluctuations, Terrestrial, and Glacial Periods. R. Spitaler ... 1399
Seiches of Lake Inawasiro ... 776
„ of Lake Tōya. K. Sano ... 777
Seismograph at Central Office of Meteorology, Rome. G. Agamennone 769
Seismological Investigations. J. Milne ... 31
Solar Radiation, Diminution of, during 1912. L. Gorczyński ... 1791
„ „ , „ , in 1912. A. Schedler ... 1790
Subterranean Waters, Temperatures of. E. A. Martel ... 934
Temperature Observations in Loch Earn. E. M. Wedderburn ... 362
Tidal Phenomena in Western Mediterranean. R. v. Sterneck ... 361
Tides, Stationary, of Second Order, Production of. E. Fichot ... 778
Waves, Ocean; Sea-beaches and Sandbanks. V. Cornish ... 923

Thermo-Electricity and Thermo-Magnetism.
Contact of Two Conductors, Electrothermal Phenomena at: Application to Detectors. W. H. Eccles ... 1727
Electron Theory of Thermo-electricity. O. W. Richardson ... 684
„ „ „ . J. M'Whan ... 1983
Iron-Nickel-Carbon System, Thermo-electrics of. E. L. Dupuy and A. Portevin ... 511
Measurements, *see* separate section.
Nickel and Manganese Steels, Thermoelectrics of. S. Hilpert and F. Hermann ... 1876
Silicon, Thermoelectric Power of. F. Fischer, R. Lepsius, and E. Baerwind ... 1341
„ , Thermoelectric Power of. J. Koenigsberger ... 1722
Steels, Thermo-electricity of. W. Broniewski ... 1498
> Thermo-couples, cold-junction Corrections for. P. D. Foote ... 1499
Thermoelectric Couples. G. Meslin ... 682
Thermopiles, Bismuth. W. W. Coblentz ... 1500
Thomson-effect. H. R. Nettleton ... 1051
„ „ , Theory of. H. Horig ... 1343
Tungsten and Molybdenum, Thermal E.M.F. of. E. F. Northrup ... 683

V.1
191

7.16
1913

Abstract Nos.

Thermodynamics, *see also* section Gases.
Black-body Radiation and Quanta Theory. J. de Boissoudy 1018
„ Radiation, Mechanism of. A. Korn 1980
„ „ , Theory of. M. Brillouin 829
Canonical Equation of Condition and Quanta Theory. K. Eisenmann 835
Chemical Equilibrium, *see also* separate section.
Corresponding States and Law of Guldberg. A. Leduc 1095
„ „ „ of Saturation Curves. E. H. Amagat 1094
„ „ , Laws of. E. H. Amagat 1093
Diagrams of State, obtaining p-T-Lines for Constructing. G. Tammann 831
Electrons, Free, in Metals. W. H. Keesom 1976
Elementary Working-quantum, Universal Significance of. O. Sackur 463
Energy-Content of Gases. W. Nernst 632
„ , Dissipation of. L. Décombe 1015
„ , Elements of. J. Duclaux 833
„ , Internal, Calculation of, from Characteristic Equation. E. Kohl 461
Entropy Analogue, New. v. Karapetoff 1174
„ and Vapour Pressure of Monatomic Substances. O. Stern... 1977
„ Principle, Boltzmann's, Destruction of. W. H. Keesom...... 644
„ , Adiabatic Increase of. P. Duhem 832
Equation of State for Solid Bodies. H. Alterthum 642
„ „ for Solids. E. Rasch 735
„ „ , Fundamental Properties of. R. D. Kleeman 308
Fundamental Inequalities, Two, in Thermodynamics. P. Duhem ... 1175
Gas Equation. S. D. Wicksell 459
Irreversibility and Kinetic Theory. E Borel 1017
Liquids, Thermodynamic Properties of, between 20° and 80° and up to 12,000 kg./cm.². P. W. Bridgman 1304
Minimum Critical Temperature, Condition for Existence of. J. D. van der Waals 310
Molecular Agitation at Absolute Zero. A. Einstein and O. Stern...... 1016
„ Phenomena not in Agreement with Thermodynamics. M. v. Smoluchowski 633
Partition of Energy, Deviations from Law of. J. D. van der Waals 1981
„ „ , Law of. J. D. van der Waals, Jr. 1696
„ of Velocities. E. Gehrcke 1978
Photo-chemical Equivalence, Thermodynamical Deduction of Law of. Einstein 1699
Planck's Law of Distribution of Energy, Deduction of. C. Benedicks 1453
Potential of Mixtures, Thermodynamic Calculation of. J. J. van Laar 311
Principle of Least Work of Deformation. T. Pöschl 1306
p-T-v-surface, Thomson-van der Waals, Realisation of. J. Meyer ... 91
Quanta Hypothesis, New Thermodynamic Consequence of. M. Pólyányi 1012
„ Theory of Gases and Liquids. H. Tetrode 1013
„ „ , Monatomic Gases and. W. H. Keesom 1975
Radiation Determinations. W. Gerlach 1176
„ , Atomic Theories of. R. A. Millikan 830
„ , Recent Theories of Heat and. W. Wien 1700
„ , Statistical Theory of. K. F. Herzfeld 834
Rectilinear Diameter for Argon. E. Mathias, H. K. Onnes, and C. A. Crommelin 1170
Second Law, Boltzmann Proof of. P. Hertz 98
„ „ , True, of Thermodynamics. J. T. Wainwright 96
„ Virial Coefficient for Diatomic Gases. W. H. Keesom 455
„ „ „ for Monatomic Gases and for Hydrogen. W. H. Keesom 634
Solids, Theory of. S. Ratnowsky 1014

Abstract Nos.

Thermodynamics, *continued.*
Stability of Form, Relation between Geometrical Form, Solubility and. W. J. Jones 1694
„ of Thermal Equilibrium. P. Duhem 643
Statistical Mechanics and Probability of Complexion. P. Hertz...... 1979
Stefan-Boltzmann's Law, Constant in. S. Valentiner 99
Stefan's Formula, Value of Constant in. C. Féry and M. Drecq 1452
Thermal Quantities for Argon, Calculation of. H. K. Onnes and C. A. Crommelin 1171
Triple Point of Methane. C. A. Crommelin 454

Thermometry, Pyrometry, and Calorimetry.
Dispersive Power of Platinum Black. C. Féry and M. Drecq......... 630
Gas Thermometry, High-temperature. A. L. Day. R. B. Sosman, and E. T. Allen 450
Heats of Solution of Metals, Determination of, by Vacuum Flask Calorimeter. E. E. Somermeier 1010
Hydrogen- and Resistance-thermometer between 0° and − 193° C. F. Henning.......... 1169
Micropyrometer. G. K. Burgess.......... 621
Nitrogen Thermometer Scale from 300° to 630°. A. L. Day and R. B. Sosman 93
Psychrometric Formula. G. Smeal.......... 443
Sulphur Point, Constancy of. W. Meissner 451
Temperature of Wedge-shaped Cavity : Use as Black Body. B. J. Spence.......... 1305
„ Scale, Present Status of. G. K. Burgess.......... 1173
Thermodynamic Temperatures, Scale for Calculating. G. A. Shook 627
Thermometric Lag. D. R. Harper.......... 629

Vapour Pressure.
Alkali Metals, Vapour Pressures of. A. Kröner 1009
Amalgams, Liquid Tin, Vapour Pressure of. A. Sieverts and H. Oehme.......... 1555
Aqueous Solutions, Concentrated, Vapour Pressure of. E. P. Perman and T. W. Price.......... 291
Metals, Vapour Pressures of. I. H. v. Wartenberg 1848
Monatomic Substances, Vapour Pressure and Entropy of. O. Stern.......... 1977
Nitrogen Tetroxide, Determinations of Vapour Tension of. F. E. C. Scheffer and J. P. Treub.......... 198
Relation between Geometrical Form and Vapour Pressure. W. J. Jones 1694
Sulphuric Acid Solutions, Alteration of Vapour Pressures of. C. Hacker.......... 1092

Viscosity.
Air-Flow, Resistance to, in Pipes. A. H. Gibson.......... 13
„ , Viscosity of. L. Gilchrist 914
„ , „ of. R. A. Millikan 1577
Fluid Flow, Laws of. v. Kaplan 15
Fluidity and Viscosity. E. C. Bingham 536
Gases, Rarefied, Internal Friction of. A. Timiriazeff.......... 1240
„ , Thermal Properties and Viscosity of. A. Eucken 1301
„ , Viscosity of. H. Piwnikiewicz.......... 1114
„ , „ of. I. Hydrogen. II. Helium. H. K. Onnes, C. Dorsman, and S. Weber 1446
Ice, Glacier, Viscosity of. R. M. Deeley and P. H. Parr 1590
Liquids, Anisotropic, Viscosity of. F. Krüger 1927
„ , Effect of Temperature of, on Viscosity. W. Sorkau......... 23
Motion of Sphere in Viscous Liquids. U. Cisotti.......... 159
„ of Viscous Fluid under Rotating Plate. H. Sanders.......... 16
Recent Viscosity Investigations, Criticism of. E. C. Bingham......... 1751
Superficial Viscosity ; Drop falling within Fluid of Lower Density. J. Boussinesq 913

For the **Explanation** of this Index see p. 697.

V.16
1913

7.16
.913

Abstract Nos.

Viscosity, *continued.*
Superficial Viscosity, Existence of, in Thin Transition Layer. J. Boussinesq 912
Turbulence Viscosity and Molecular Weight. W. Sorkau 1090
Water, Relative Viscosities of, at 0°, 18°, 25°, and 50°. E. W. Washburn and G. Y. Williams 1576

Vision.
Colour-blindness, Incomplete. W. Abney 71
„ Vision: Measurement of Retinal Fatigue. W. de W. Abney 178
„ Visions, Normal and Abnormal, Luminosity Curves of Persons having. W. Watson 1423
Eyestrain and Illumination. E. M. Alger 1144
Extinction of Light by Illuminated Retina. W. Abney 58
Perception of Lights of Short Duration at Range Limits. A. Blondel and J. Rey 177
Point Sources of Light. C. C. Paterson and B. P. Dudding 394
Rod Vision. O. Lummer 798
Spectrum Luminosity Curves by Method of Critical Frequency. H. E. Ives, Rayleigh 393
Zeeman-effect, *see* separate section.

Zeeman-effect and Radiation in a Magnetic Field.
Aluminium Lines in Canal Rays. J. Stark, R. Künzer, and G. Wendt 1283
Anomalous Zeeman-effect of Spectral Lines of D-type. W. Voigt 1826
β-Rays, Magnetic Spectrum of, from Radio-Actinium. O. v. Baeyer, O. Hahn, and L. Meitner 1285
Bromine, Magnetic Spectrum of. G. Ribaud 421
Discharge, Vacuum-tube, in Magnetic Field. N. A. Kent and R. M. Frye 1280
Hydrogen Lines, Zeeman-effect of. F. Croze 420
Lithium Line, Red. P. Zeeman 1281
Longitudinal Zeeman-effect. L. de la Rive 809
Magnetic Rotatory Polarisation, *see* section Polarisation.
Measurement of Zeeman-effect. G. F. C. Searle 1825
Mercury Green Line, Constitution of. F. F. S. Bryson and J. Logie 1956
„ Line, Green, and Satellites: Relative Intensities. H. Nagaoka and T. Takamine 807
„ Lines, Anomalous Zeeman-effect in Satellites of. H. Nagaoka and T. Takamine 1958
„ Vapour, Inverse Zeeman-effect in. H. Starke and J. Herweg 603
Mutual Influence of Lines of Same System in Magnetic Field. G. Wendt 983
Ritz Theory of Normal Zeeman-effect. K. Körner 808
Simplification of Spectral Lines by Magnetic Field. R. Fortrat 1439
Triplet, Magnetic Normal, and Preston's Law. R. Fortrat 1440
Zeeman-effect. C. Wali-Mohammad 68
„ . F. Paschen and E. Back 419
„ . R. Fortrat 423
„ . G. J. Elias 426
„ . W. Voigt 806
„ . A. Sommerfeld 1151
„ . F. Paschen and E. Back 1282
„ . W. Voigt 1441
„ , False Dissymmetries in. K. Körner 73
„ , Theory of, in any Direction. K. Försterling 67
„ , „ , observed in any Direction. H. A. Lorentz 602